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ABSTRACT

The document contains six research papers on language and communication disorders. Entries include the following titles and authors: "A Method of Pragmatic Analysis for a Down's Syndrome Child" (P. Halfond and P. Tamari); "Follow the Leader--Why a Language Disordered Child Can't Be 'It'" (C. Grossfeld and E. Geller); "Communication Patterns of an Autistic Child" (R. Rosoff and E. Tiegerman); "Children's Perception of Sequenced Pitch Patterns" (D. Hughes and M. Mazor); "The Role of Verb Aspect in Training a Grammatical Morpheme" (P. Birenbaum and F. Feintuch); and "Nature of Spelling Errors in Transcortical Sensory Aphasia--A Case Study" (M. Grossfeld and L. Clark). Cited among study findings are that it was possible to use J. Dore's categories of pragmatic functions with the mentally retarded child and apply it to verbal and nonverbal communicative interests; that the parents of a language impaired child had a directive style with their child and that their input was not semantically related to the child's ongoing nonverbal and/or verbal activities; that a language impaired child's communicative interactional skills indicated a pattern of development different from that of the normal child; that mode of response (hummed or manual) significantly affected scores of 30 young children on the Pitch Pattern Sequence Test; that verb aspect was not the main factor contributing to production of the morpheme by a young language disabled child; and that an adult with transcortical sensory aphasia had fairly well preserved knowledge of the visual image of a word as a whole. (SB)

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WORKING PAPERS IN EXPERIMENTAL SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY

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This ninth volume of the Working Papers continues to reflect a philosophy which embraces the need to test hypotheses and to apply theoretical constructs to the clinical situation. In this volume, there is continued attention to the pragmatic aspects of language as well as other characteristics of disordered communication.

The enthusiasm and excitement which these papers have generated has made our continuing commitment to their publication very worthwhile.

Robert Rosenbaum
Joel Stark

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A method of pragmatic analysis for a Down's Syndrome child

Paula Halfond
Pauline Lipson Tamari*

Abstract

The purpose of this study was to evaluate a method for analyzing the pragmatic functions in the language of a Down's Syndrome child, determine if this method could be applied to verbal and non-verbal communicative intents, and analyze differences in usage dependent on activity contexts and subject interactions. During interaction with the investigator, language samples (a minimum of 350 intents) were collected from the Down's Syndrome child, a normal child of matched C.A. and a normal child of matched M.L.U. Usage of intents in three activity contexts across interactions were analyzed. Results indicated an ability to use Dore's (1976) method, applied to verbal and nonverbal intents. Differences emerged in usage in contexts and interactions. The mentally retarded child appeared more similar to the normal child of matched C.A. than the subject matched for M.L.U. Implications for future research and clinical intervention are discussed.

The interest in child language in the late 1960's through 1970's has been undergoing variations in emphasis. This interest included generative grammar, through which authors attempted to capture a complete picture of child language (Lackner 1968). It was observed that this type of analysis was incomplete without including underlying meaning (semantics). These underlying semantic operations were inter-related with the rules of syntax (Bowerman 1973).

In addition to the rules of syntax with its underlying content, the speaking and perception of language includes the uses of language, or pragmatics. Some investigators began to observe that certain language disordered children did not "sound" the same as normal children of equal linguistic abilities. This observation was noted by Tamari (1978) in her study of four Down's Syndrome children. The author compared her subjects to a comparative group taken from a study by Bloom, Lightbown, and Hood (1975). Mean length of utterance (M.L.U.) was used as a comparative device between the two groups. Generally, it was noted that both groups exhibited similar semantic/syntactic relations; however, Tamari noted they still did not "sound" the same. The difference in the way the children "sounded" was attributed to the way the subjects used their language; or a disorder in the pragmatics of language.

Children normally learn to use language for different purposes such as to get and give information, initiate and monitor interactions with others (Bloom and Lahey 1978). Language use has been broken down into several sub-areas including speech acts, or the acts that are performed with words (Austin 1962, Searle 1969). These speech acts

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are considered by Searle to be basic minimal units of linguistic communication. Another aspect of pragmatics deals with the functions speech acts serve in meeting individual needs (Halliday 1975, Hymes 1964). A third area is the abilities of the individual to presuppose what the listener already knows and then relate this information into the content of language produced (Gordon and Lakoff 1975).

If a child learns to use language to fulfil the above areas, then language develops appropriately. If there is a lack in an area of language use, even though the child codes semantic/syntactic relations appropriately, he would not "sound" normal. Bates (1976) studied the pragmatics of infant communication, and pointed out that all meaning in early child language is basically pragmatic. She stated that children learn how to use language according to the contexts the language occurs in, not according to the inherent sign-referent relations. They do this by playing with sounds through language games in order to appropriately define these contexts. She additionally suggested that these pragmatic functions may also be satisfied in a nonverbal manner.

Bates, Camaioni, and Volterra (1975), traced the development of performatives or illocutionary acts in three infants. Performatives are speech acts which perform such functions as stating, commanding, promising, questioning, requesting, warning, and so forth. The authors concluded that early performatives emerged at the age of 10 months. Dore (1975) also associated speech acts at the one-word stage with the start of language. He applied a speech acts analysis, yet used intonation patterns of these verbal speech acts to more accurately classify them. Due to this added view of intonation patterns Dore was able to support his finding that one utterance or single word might express a variety of meanings (or different speech acts). Dore (1976) analyzed the pragmatics of the verbal acts of seven three-year old children recorded on video-tape in a free play situation. He classified the children's illocutionary acts into various categories further described in the Appendix (Requests, Responses, Descriptions, Statements, Conversational Devices, and a more restrictive class of Performatives). The utterances' intonational characteristics, literal meaning, presupposition involved, listener conditions, contextual information, and nonverbal behavior were all considered while classifying each verbal act. Dore found that the children exhibited behavior in all of the categories.

The role of the listener in influencing the pragmatic functions of language during interactional contexts has been considered. Gleason (1975), found that children by the age of eight have developed distinct styles for speaking to various listeners. She found that functions such as request-demands were used by the children to their parents; narrative-statements were used in speech to other adults; whereas non-linguistic ritual play and repetitive language was used with younger children. Shatz and Gelman (1973) found that children as young as four used different types of language in regard to the

listener's age (younger listeners, peers, and adults). Some variances included the greater use of attentional devices, as well as less complex linguistic forms with the younger listeners. This indicates that varying interactional contexts will produce varying levels and types of language from the same child.

The methods of analysis of pragmatics in normal children may be applied to language disordered children. Snyder (1975) described the pragmatic performance of twenty-one language impaired children at the one-word stage, as compared to twenty-one normal children on the basis of their similar linguistic development (M.L.U.). Snyder set up contexts to elicit imperative and declarative performatives and presuppositional skills. To measure the performatives, the response of the child was rated on a scale ranging from verbal to nonverbal behaviors. The author found that the language impaired children matched with the normal children were deficient in their use of language. The experimental group did better on the presuppositional measures when using nonverbal responses rather than verbal responses. This finding indicated the children encoded the less informative elements in the context. The language impaired children still performed poorer on the presuppositional and performative measures than the normal children.

Schechterman, Wollner, and Geller (1978) studied the communicative competence of an emotionally disturbed child, aged 4.9, who also was language disordered. This child was compared with two children considered normal; one matched on the basis of chronological age (C.A.) and the other on the basis of mean length of utterance (M.L.U.). The authors found that the emotionally disturbed child exhibited a deficit in pragmatic abilities; language was rarely used in descriptive communicative intentions. When compared with the normal child of similar M.L.U., significant differences were noted in the type and frequency of communicative intentions during elicited contexts. The emotionally disturbed child used significantly more requests than the normal child, who used more discriptions.

There have been limited studies on the pragmatics of the language of mentally retarded children. Sabsay (1975) found severely mentally retarded adults to converse with varying degrees of success with retarded and nonretarded individuals in their environment. The communicative success was higher in retardate-retardate conversations. This communicative success was defined in terms of the speaker making himself understood to the listener, and the existence of good examples of conversational responses. Bedrosian and Prutting (1978) found that mentally retarded adults used the same types of conversational control as normal adults. The literature has indicated that the language abilities of the mentally retarded child (semantics, syntax, phonology, morphology), are delayed rather than deviant relative to normal child language (Lovell and Bradbury 1966, Ryan 1975, Tamari 1978). If this is so, then pragmatics would be delayed at the same level as the other aspects of language.

The purpose of this study was to investigate the verbal and nonverbal pragmatic functions of language in a Down's Syndrome child. This method was used to analyze the pragmatic functions of the Down's Syndrome child during interaction with an adult (the investigator), a normal child at the same linguistic level (M.L.U.), and a normal child of the same chronological age (C.A.). The following questions were formulated:

1) To what extent can the methods used to analyze pragmatic functions in normal child language be applied to the language of a mentally retarded child?

2) To what extent can the categories of pragmatic functions, previously applied by Dore (1976) to verbal communicative intents, be applied to nonverbal communicative intents?

3) To what extent does the mentally retarded child show differences in the use of pragmatic functions in varying contexts (different activities and subject interactions)?

4) How do the pragmatic functions of language in a mentally retarded child compare with those of a normal child of matched C.A. and a normal child matched on the basis of M.L.U.?

Method

Subjects:

Subject A was a 7.6 year old Down's Syndrome female who was the youngest of nine siblings. Her IQ was found to be within the educable retarded range. The parents reported a normal pregnancy and birth, however, A was delayed in all developmental milestones. She walked at 20 months, spoke single words at 3 years and combined words at 4 years. She was enrolled in a variety of infant, pre-school and pre-placement programs since she was six months old. At the time of this study the subject was enrolled in a first grade class for minimally brain damaged children. A reportedly interacted well with peers and siblings. The investigators felt that A's parents spent a good amount of time interacting with her at home.

The subject's initial speech evaluation at the Queens College Speech and Hearing Center was conducted on June 1, 1978 after which speech and language therapy was recommended. A's speech was judged to be relatively intelligible with some sound substitutions, omissions, distortions; denasal voice quality; and low volume. The subject's M.L.U. was found to be 3.81 morphemes, based on three spontaneous language samples considered representative of her language abilities. Goals for therapy included increasing grammatical complexity of utterances through sentence expansion; asking and responding to various wh- question forms; and increasing child-initiated utterances. She appeared to code semantic/syntactic relations appropriately; however, utterances sometimes exceeded the expected syntactic complexity for a child with such a M.L.U. Additionally, although A showed mature

lexical usage for a child of her abilities and M.L.U., her language was often confusing and inappropriate.

During the six months of therapy prior to the study, it appeared to the investigators that this child had difficulty relating to peers, being a stubborn child who was used to getting her own way. A did react well to direction from an adult. The parents had high expectations for A and seemed anxious for her to achieve, but they found it difficult to accept some of the language difficulties.

Subject B was a 3.9 year old female who was the youngest of two siblings. Her mother reported a normal pregnancy and birth; with subsequent developmental milestones acquired within normal limits. From the age of 2, B was enrolled in a playgroup program and a nursery school. B reportedly interacted well with adults and children of all ages; her personality described as extremely easygoing, outgoing, and warm. The subject's M.L.U. of 3.76 morphemes was based on a spontaneous language sample considered representative of her language abilities.

Subject C was a 7.8 year old female, who was the second of three siblings. The mother reported a normal pregnancy and birth, with subsequent developmental milestones acquired within normal limits. At the time of this study C was enrolled in a third grade class. She reportedly interacted well with adults and children of all ages. She was described as being verbal with an outgoing personality.

Apparatus:

Experimental sessions were conducted in a 10' by 13' room at the Queens College Speech and Hearing Center. The area was cleared except for those stimuli necessary for the three activity contexts. Toys for the free play activity were selected by the subjects. The toys included: Doctor's kit; Fisher Price playhouse with Fisher Price people, Sesame Street characters, furniture, and playground toys; Play kitchen items including pots, pans, dishes, cups, and silverware; Toy food; and small trucks and cars. For the second activity context, snack period, a variety of foods including crackers, raisins, popcorn, and peanuts were present, enabling the subjects to choose the ones which they desired. A drink was also present, as well as cups and napkins. For the third activity, the game Candyland (Milton Bradley) was played.

Procedure:

Data, in the form of language samples, was collected with Subject A during the sessions. These sessions were audio-recorded with a Panasonic portable cassette tape recorder. The contextual, verbal, and nonverbal information was included in notes taken by the investigator during each session. This information was used to aid in making distinctions between the implicit and explicit functions of the communicative intents. Additionally, since the nonverbal use of pragmatic functions was observed, it was important that all contextual information be considered. The audio tapes were then transcribed, coordinating

contextual, verbal and nonverbal data into a final written transcription.

Language samples were collected with Subject A in interaction with an adult (the investigator); a normal child of the same linguistic level (Subject B); and a normal child of the same chronological age (Subject C). Each of these interactions were continued until a minimum of 350 communicative intents were recorded for each subject. These sessions had minimal input from the investigators, allowing for maximum interaction between subjects. In the interaction involving Subject A and the investigator, the investigator followed the protocol suggested by Bloom and Lahey (1978) for eliciting a language sample.

Each interactional session consisted of three activity contexts. The first activity was a free play situation, during which activities were child-initiated and selected. The children were able to change activities when they desired. This context occurred first in each session and lasted approximately 20 minutes. The second activity was a snack period, during which a drink and variety of snacks were offered. This context always occurred second in each session and lasted approximately 15 minutes. In the third activity the subjects interacted while playing a structured board game. This context occurred last in each session for approximately 20 minutes.

Once the language samples were collected, Dore's (1976, Appendix) method of analyzing pragmatic functions was chosen for analysis. Dore's categories seemed to be comprehensive and usable with verbal and nonverbal communicative intents. A communicative intent was defined as being a verbal or nonverbal illocutionary act which had a specific communicative property or function. The intonation, literal meaning, contextual information, nonverbal behavior, and listener conditions present for each communicative intent were considerations in the decision for each classification.

Portions of each session's data were analyzed by both investigators independently, in order to judge inter-rater reliability. Overall reliability was found to be .82. If a communicative intent was judged to contain more than one pragmatic function, it was multi-coded.

Proportional frequencies for each pragmatic category were used to compare pragmatic functions used by the mentally retarded child and the normal children. The pragmatic functions used by Subject A were viewed across interactions with the investigator, Subject B and Subject C. Additionally, these proportional frequencies were used to view the activity contexts within each of the subject interactions.

Results

The results of this study indicated that the methods used to categorize and analyze the pragmatic functions could be applied to the normal children and the mentally retarded child used in this study. The mentally retarded child's language was judged by the investigators to be .80 intelligible; therefore, intelligibility was not a limiting factor in the transcription of language samples.

Subject A's language was sufficiently developed, as indicated by her M.L.U. of 3.81 morphemes, to obtain language samples in communicative discourse.

The mean number of communicative intents for Subject A across all three language samples (A_A, A_B, A_C), was a total of 427. Of this total, .89 of Subject A's communicative intents were accounted for in the analysis of pragmatic functions. Dore (1976), in his study of normal three year old children, was able to account for .92 of the communicative intents. Additionally, he found that the pragmatic functions of Requests, Responses, Descriptions, and Statements accounted for .82 of the communicative intents of his children. This study found these same pragmatic functions accounted for .92 of Subject A's, .76 of Subject B's, and .90 of Subject C's communicative intents. This indicated that the communicative intents of the mentally retarded child, as well as the normal children, could be accounted for by the same categories of pragmatic functions as used by Dore (1976).

Table I shows the percentage of communicative intents that were coded nonverbally and verbally. It can be seen that for all subjects, verbal intents comprised the largest percentage of communicative intents.

Table 1

Percentage of nonverbal and verbal communicative intents for each subject

Intents	Subjects		
	A	B	C
Nonverbal	.18	.14	.11
Verbal	.82	.86	.89

An analysis was made to determine whether the subjects were using pragmatic functions nonverbally that they were not using verbally. With the exception of two different functions for two of the subjects, all pragmatic functions coded by the subjects nonverbally were coded verbally. Subject A verbally used all pragmatic functions that she used nonverbally, except for Response Compliance (RSCO), which was used in 56 nonverbal communicative intents comprising .54 of her total nonverbal intents. Subject B verbally used all pragmatic functions that she used nonverbally, except for Jokes within the category of Performatives. She used Jokes in 6 nonverbal communicative intents which comprised .13 of her total nonverbal intents. Subject C verbally used all pragmatic functions that she used nonverbally.

The investigators were interested in whether the inclusion of nonverbal communicative intents would change the percentage of usage within the four major categories of pragmatic functions. These percentages of usage for Subject A during interaction with the

investigator (A_A, A_B, A_C) are shown in Table 2. These percentages were reported for verbal, nonverbal, and both verbal and nonverbal combined communicative intents. Nonverbal influence was not notable since the combined percentage for each category was always closer to the verbal percentage. In addition, with the exception of two subjects (A_C and B), the inclusion of nonverbal percentages did not change the rank order of these major categories.

Table 2

Percentage of usage of four major pragmatic categories within verbal, nonberbal, and verbal and nonverbal combined intents for all subjects

	Subjects														
	A_A			A_B			A_C			B			C		
Major Categories	V	NV	V+NV	V	NV	V+NV	V	NV	V+NV	V	NV	V+NV	V	NV	V+NV
Requests	22.6	5.4	17.3	19.6	6.4	17.8	28.0	5.4	24.6	12.9	4.4	11.6	22.3	14.9	21.8
Responses	46.7	64.6	52.3	7.0	48.9	12.6	10.7	87.5	22.2	26.3	52.2	30.2	14.7	66.6	20.9
Descriptions	27.2	20.8	25.2	45.9	12.8	41.4	37.8	—	32.1	20.4	6.5	18.3	28.7	4.8	25.8
Statements	9.1	2.3	7.0	23.9	—	20.7	19.5	—	16.6	27.5	—	23.3	37.5	2.4	33.2

The use of pragmatic functions by Subject A was viewed across subject interactions and activity contexts to determine if differences occurred. The rank orders of the four most frequently used pragmatic categories during interaction of Subject A with the adult (A_A), Subject B (A_B), and Subject C (A_C) are shown in Table 3. The combination of verbal and nonverbal communicative intents was utilized. As can be seen, the most frequently used pragmatic categories were relatively consistent within the three subject interactions, but the rank order changed with the greatest change observed in A_B.

Table 3

Four most frequently used major pragmatic categories in rank order of use for Subject A across subject interactions

Rank Order	A_A	A_B	A_C
1	Responses	Descriptions	Descriptions
2	Descriptions	Statements	Requests
3	Requests	Requests	Responses
4	Statements	Conversational Devices	Statements

The analysis of communicative intents in relation to subject interactions (A_A, A_B, A_C) are shown in Table 4. Verbal and nonverbal communicative intents were combined for viewing the use of pragmatic functions. It can be seen that Subject A's use of the category of Requests was relatively constant during each of the interactions. Intersubject variability was noted in the subcategories of Requests. The highest frequency of Responses occurred during interaction with the investigator (A_A); while the lowest frequency occurred during interaction with Subject B (A_B). The highest frequency of Descriptions, Statements, and Conversational Devices occurred during interaction with Subject B (A_B), while the lowest frequency of these categories occurred during interaction with the investigator (A_A). For the category of Performatives, the frequency of occurrence remained relatively constant across all subject interactions (A_A, A_B, A_C).

Table 4

Percentage of usage of pragmatic functions across subject interactions for Subject A

Pragmatic Category	A_A	A_B	A_C
Requests	17.3	17.8	24.6
RQYN	1.2	4.6	9.1
RQWH	8.4	5.5	7.8
RQAC	3.4	6.0	6.4
RQPH	3.4	1.4	.8
RQRQ	.9	.3	.5
Responses	52.3	12.6	22.2
RSYN	18.5	.3	2.4
RSWH	7.4	1.7	1.3
RSAC	8.2	4.0	7.0
RSCO	12.7	5.2	10.2
RSQL	5.5	1.4	1.3
Descriptions	25.2	41.4	32.1
DSID	9.6	10.0	13.4
DSPO	2.0	5.2	1.9
DSEV	8.4	6.6	3.2
DSPR	3.8	11.8	10.7
DSLO	1.4	7.8	2.9
Statements	7.0	20.7	16.6
STRU	.5	4.9	3.7
STEV	1.5	4.3	3.7
STIR	4.6	8.6	6.2
STAT	.2	1.7	1.9
STEX	.2	1.2	1.1
Conversational Devices	5.0	13.8	8.8
CDBM	--	1.2	--
CDCA	.2	5.7	1.6
CDAC	1.9	4.9	5.9
CDRE	2.9	2.0	1.3
CDPH	--	--	--
Performatives	5.8	7.8	6.2
ROLE	3.2	.6	--
PROT	.2	.9	.8
JOKE	--	--	.3
GAME	1.7	1.4	.5
CLAI	.7	3.4	4.1
WARN	--	.6	--
TEAS	--	[illegible]	.5
Equivocal	1.4	.9	--
Uninterpretable	2.2	3.4	.5
Sub-total	116.2	118.4	111.0
-Multi-coded	16.2	18.4	11.0
Total	100.0	100.0	100.0

The total number of communicative intents used across subject interactions within all activity contexts is shown in Table 5. It can be seen that the greatest number of communicative intents were produced in Context 1 (free play) for two subject interactions (A_A and A_B), and Context 3 (board game) (for interaction A_C). Context 2 (snack) consistently produced the least amount of communicative intents.

Table 5

Total number of communicative intents across activity contexts within subject interactions

	Context 1	Context 2	Context 3	Total
A_A	388	19	77	484
A_B	388	93	186	667
A_C	85	21	310	416

Verbal and nonverbal communicative intents were combined for Subject A across all activity contexts within subject interactions. The rank orders for the four most frequently used categories of pragmatic functions of these communicative intents are shown in Table 6. The categories used remained consistent, although the rank order changed for all contexts. The greatest changes depended on the subject interaction being viewed.

Table 6

Four most frequently used pragmatic categories in rank order of use for Subject A across activity contexts within each subject interaction

	Context 1			Context 2			Context 3		
	A_A	A_B	A_C	A_A	A_B	A_C	A_A	A_B	A_C
1	RS	DS	RQ	RS	ST	ST	RS	DS	DS
2	DS	RQ	DS	RQ	RQ	RQ	DS	ST	RS
3	RQ	RS	CD	DS	DS	RS	RQ	CD	RQ
4	ST/CD	CD	RS	ST/CD	RS/CD	DS/CD	ST	RS	ST

Requests = RQ Responses = RS Descriptions = DS
Statements = ST Conversational Devices = CD

In order to look at the pragmatic functions for each of the activity contexts, the combined frequencies for the various subject interactions were analyzed. The number of intents within the pragmatic categories for each of the activity contexts are shown in Table 7. It can be seen that Context 1 produced the most pragmatic functions of Requests and Responses. Context 3 produced the most pragmatic functions of Descriptions, Statements, Conversational Devices, and Performatives. Context 2 consistently produced the least number of pragmatic functions.

Table 7

Number of communicative intents within activity contexts for each pragmatic category

Contexts	1	2	3	Total
Requests	113	32	81	226
Responses	199	22	124	345
Descriptions	170	25	174	369
Statements	43	33	87	163
Conversational Devices	37	12	57	106
Performatives	32	3	47	82

An attempt was made to show how the pragmatic functions of language used by Subject A compared with those used by Subjects B and C. The four most frequently used categories of pragmatic functions were listed in rank order in Table 8. The pragmatic functions that each of the subjects used remained relatively constant; however, their rank order changed.

Table 8

Four most frequently used categories in rank order of use for interactions of Subjects A-B and Subjects A-C

	A	B	A	C
1	Descriptions	Responses	Descriptions	Statements
2	Statements	Statements	Requests	Descriptions
3	Requests	Descriptions	Responses	Requests
4	Conversational Devices	Performatives	Statements	Responses

The proportional frequencies of each pragmatic category for each subject interation (A-B and A-C) are shown in Table 9. It can be seen that the proportional frequencies were much similar for the interaction of Subjects A-C; than for the interaction of Subjects A-B.

Table 9

Proportional frequencies for each pragmatic category with subject interactions A-B and A-C

	Req.	Resp.	Descr.	State.	Conv.Dev.	Perform.
A-B	.18-.12	.13-.30	.41-.18	.21-.23	.14-.8	.8-.15
A-C	.25-.22	.22-.21	.32-.26	.17-.33	.9-.7	.6-.5

Discussion

The findings indicated that for all of the subjects, verbal communicative intents were used more frequently than nonverbal communicative intents, and the inclusion of nonverbal intents did not greatly change the percentage of usage of pragmatic functions. The difficulty in describing and collecting the nonverbal communicative behavior may have been due to the limiting use of audio recordings and written transcriptions, since many of the nonverbal communicative intents may have been missed and therefore did not influence the data. Video-tape data would have given a more complete basis for the analysis of communicative intents, specifically nonverbal intents (Bloom and Lahey 1978).

In the analysis of the nonverbal behavior, without the use of video recording it sometimes proved difficult to distinguish between nonverbal behaviors that preceded or followed a verbal coding (and was clearly part of the coded intent) and those verbal behaviors that represented specific nonverbal communicative intents. In addition, there was nonverbal communicative behavior that did not fall into any of the specified categories of pragmatic functions and so many times these behaviors were categorized as ambiguous or equivocal. These factors may account for the low percentage of nonverbal communicative intents and also for the fact that no new pragmatic functions were coded nonverbally by the subjects. Future research should examine the various methods of analysis and categorization to determine the most effective procedures for analyzing pragmatic functions of language, especially for nonverbal communication.

The results of this study clearly indicated that predescribed categories could be used to account for communicative intents. These categories accounted for .89 of Subject A's intents; and four specific major categories of pragmatic functions accounted for .92 of Subject A's, .76 of Subject B's, and .90 of Subject C's intents. However, it was not a satisfactory method of viewing communicative behavior.

Children as language learners and users take into account the role of speaker-listener interaction (discourse). This is important to consider when viewing the pragmatic functions of language. In order to study pragmatic functions, especially as they relate to disordered or delayed language, the appropriateness of the language in discourse situations has to be considered. Viewing pragmatics and semantics as interrelated (Curtiss et al. 1979), the question of appropriateness and relevancy of language might be answered. Future research needs to address the area of appropriateness and relevancy in communicative discourse.

Pragmatics seems to develop at a younger age than semantics or syntax. Curtiss et al. (1979), has shown that hearing impaired children as young as 22 months expressed all pragmatic categories, whereas not all semantic categories were expressed by age 5. In studying the pragmatic development of mentally retarded children, it would be better to choose subjects not only younger chronologically, but whose language was at an earlier point of development. Many recent studies of the language development of mentally retarded children have indicated that indeed M.L.U. may be a more appropriate method of comparison than either C.A. or M.A. However, they have also shown that this method may show differences in relation to the age of the children and the language variable being studied.

This point becomes even more significant when comparisons are being made between mentally retarded and normal children. Matching a mentally retarded and normal child on the basis of M.L.U. can present additional variables such as size differences and degree of difference in mental age (M.A.); however, these differences possibly can be minimized if these children can be matched at a younger C.A.

The results of this study indicated that subject interaction seemed to be the strongest variable in the pragmatic functions used by the mentally retarded subject. One of the possibilities is the way the mentally retarded subject viewed the other subjects with whom she interacted. Although the normal subject matched for C.A. was the same physical size as the mentally retarded subject, it was the investigators' feeling that A reacted to C as an older child.

The results also indicated that the activity contexts seemed to be a significant variable in producing various pragmatic functions. The innate nature of the contexts produced varying numbers of communicative intents. Context 1 (free play) and 3 (structured board game) produced the most intents, whereas Context 2 (snack) produced the least intents perhaps since the subjects spent most of that time eating. Context 3 provided a structure for the subjects and produced a high and varied amount of communicative intents.

The data indicated that specified contexts provided a richness for the production of certain pragmatic functions. Context 1 produced the highest number of Requests and Responses, whereas Context 3 produced the highest number of Descriptions, Statements,

Conversational Devices, and Performatives. This area of activity contexts may be over-simplified in the literature; the specifics of the contexts have more significance than was previously reported. This is an area that not only has significance for future research, but one which clinicians become aware of as they collect language samples; certain contexts will limit the elicitation of specific pragmatic functions.

In reviewing the results of this study, the most significant variable seemed to be subject interaction. The first area of consideration dealt with the difficulty of viewing pragmatics in language without taking listener-speaker interaction into account. This study indicated that during interaction with the investigator, Subject A used the highest number of Responses, which implies that although the investigator was a trained clinician and researcher, she still must have directed the interchange. However, the highest total number of pragmatic functions were produced during this interaction. During interaction with Subject B, Subject A used the highest number of Descriptions, Statements, Conversational Devices, and Performatives, which implies that a wide variety of pragmatic functions were produced. This finding might be due to Subject A's view of herself as bigger than Subject B and thus she might have directed and initiated more of the interchange. During interaction with Subject C, Subject A produced the highest number of Requests. The rank order of the four major categories of pragmatic functions indicated that Subject A was more constant in her usage during interaction with the investigator (A_A) and Subject C (A_C), than with Subject B (A_B). This implies that output is influenced by input, and is dependent upon age, size, and roles assumed by the listener and speaker. Pragmatic functions may be more influenced by the above variables than semantic categories. This point becomes significant in relation to intervention strategies: can a child generate skills learned in intervention programs to other subject interactions (peers, siblings, parents, teachers)?

The second area of consideration dealt with the subject comparisons. The results indicated that proportional frequencies were more similar for Subjects A-C, than for Subjects A-B. This finding could be accounted for in terms of the variables discussed (size, age, roles), and by the fact that pragmatics develops earlier than semantics and syntax. The definition of pragmatic functions is an area that needs further clarification. Given the linguistic differences (semantic/syntactic) between Subjects A and C, the fact that they were more alike and had more of a reciprocal relationship between pragmatic functions used, suggests there are other developmental areas besides linguistics (i.e. cognitive, social, emotional, and experiential development) that come into play in the development of pragmatic communication.

In conclusion, this study has shown that it was possible to use Dore's (1976) categories of pragmatic functions with the mentally retarded child and apply it to verbal and nonverbal communicative intents. Differences in usage emerged in varying activity contexts and subject interactions; and the mentally retarded subject appeared more similar to the normal subject of the same chronological age than to the normal

subject of the same linguistic level. These findings are inconclusive to a larger group; however, important questions have emerged. There is a need to more clearly define pragmatic functions and to study them in relation to semantic/syntactic aspects of language and their appropriateness to the communicative discourse. Further research of pragmatic functions used by mentally retarded children needs to consider the younger child in order to understand the delay or deviance of pragmatic development.

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Appendix

from Dore (1976)

Categories for Analysis of Communicative Intents:

Requests - to solicit information, actions, or acknowledgements

Yes-No Questions - solicit affirmation or negation of the propositional content of the speaker's utterance; e.g. - "Is this a birthday cake?" (RQYN)

Wh- Questions - solicit information about the identity, location, or property of an object, event, or situation; e.g. - "Where's John?" (RQWH)

Action Requests - solicit a listener to perform, not to perform or cease to perform an action (process, etc.); e.g. - "Give me some juice!" (RQAC)

Permission Requests - solicit a listener to grant permission for the speaker to perform an action; e.g. - "Can I go?" (RQPM)

Rhetorical Questions - solicit a listener's acknowledgement to allow the speaker to continue; e.g. - "You know what I did yesterday?" (RQRQ)

Responses - directly complement preceding utterances

Yes-No Answers - complement Yes-No Questions by affirming, negating or otherwise answering them; e.g. - "No, it isn't". (RSYN)

Wh- Answers - complement Wh- Questions by providing information about the identity, etc., requested; e.g. - "John's under the table." (RSWH)

Agreements - complement previous utterances by agreeing with or denying the content; e.g. - "That isn't a car." (RSAG)

Compliances - complement requests by complying with or refusing to comply with them; e.g. - "I won't wash my hands." (RSCO)

Qualifications - complement utterances by qualifying, clarifying, or otherwise changing their content; e.g. - "But I didn't do it." (RSQL)

Descriptions - represent observable (or verifiable) aspects of the environment

Identifications - label an object, person, event or situation; e.g. - "That's a house." (DSID)

Possessions - indicate who owns or temporarily possesses an object; e.g. - "That's John's egg." (DSPO)

Events - represent the occurrence of an event, action, process, etc.; e.g. - "I'm drawing a house." (DSEV)

Properties - represent observable traits or conditions of objects, events, or situations; e.g. - "That's a red crayon." (DSPR)

Location - represent the location or direction of an object or event; e.g. - "The zoo is far away." (DSLO)

Statements - express facts, beliefs, attitudes or emotions

Rules - express rules, conventional procedures, analytic facts, definitions, or classifications; e.g. - "You have to put it there first." (STRU)

Evaluations - express impressions, attitudes, or judgements about objects, events, or situations; e.g. - "It looks like a snowman." (STEV)

Internal Reports - express internal states (emotions, sensations, etc.), capacities, or intents to perform an act; e.g. - "My leg hurts." (STIR)

Attributions - express beliefs about another's internal state, capacity, or intents, etc., e.g. - "He doesn't know the answer." (STAT)

Explanations - report reasons, causes, motives for acts or predict states of affairs; e.g. - "He did it cause he's bad." (STEX)

Conversational Devices - establish, maintain, end, or otherwise regulate interpersonal contact and conversations

Boundary Markers - initiate, or end contact or conversation; e.g. - "Hi" and "Bye". (CDBM)

Calls - make contact by soliciting attention; e.g. - "Hey John." (CDCA)

Accompaniments - signal closer contact by accompanying a speaker's action; e.g. - "Here you are". (CDAC)

Returns - acknowledge the listener's preceding utterance or fill in to maintain the conversation; e.g. - "Oh" (CDRE)

Politeness Markers - make explicit the speaker's politeness; e.g. - "Thanks." (CDPM)

Performatives - accomplish acts by being said

Role-Plays - establish a fantasy; e.g. - "This is a train". (ROLE)

Protests - object to the listener's previous behavior; e.g. - "No, don't touch that." (PROT)

Jokes - produce a humorous effect by a non-literal, playful remark; e.g. - "I throwed the soup in the ceiling." (JOKE)

Game Markers - initiate, continue, or end a game; e.g. - "You can't catch me." (GAME)

Claims - establish facts by being said; e.g. - "I'm first." (CLAI)

Warnings - notify the listener of impending harm; e.g. - "Watch out." (WARN)

Teases - annoy the listener by being provocative or taunting; e.g. - "You can't come to my house." (TEAS)

*Miscellaneous Codes -

*Uninterpretable - for unintelligible, incomplete or incomprehensible utterances.

*Double Coded - for utterances receiving two of the above codes

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*The investigators found it necessary to formulate an adapted set of miscellaneous codes for use in this study's analyses:

Equivocal - when a communicative intent can be fit into various categories but a decision cannot be made as to which categories.

Multi-Coded - for communicative intents receiving two or more of the above codes.

Uninterpretable - for unintelligible or incomprehensible communicative intents.

Follow the leader:
Why a language disordered child can't be 'it'.

Cathleen Grossfeld
Elaine Geller*

Abstract

This observational study was designed to investigate the language learning environment of a disordered child. Two specific issues were addressed. First, how does the language impaired child adapt to different types of adult input? Second, do styles of input differ among parents and their language impaired children? Specifically, mother, father and clinician input was analyzed as to its semantic and pragmatic features. Results indicated that the parents had a directive style with their child. Further, most of their input was not semantically related to the child's ongoing nonverbal and/or verbal activities. Finally, this child did not change her communicative style in response to different adult speakers.

The nature of the mother's speech to normal children learning language has been the subject of much recent research. Researchers have demonstrated that mothers' speech to young children is redundant, flexible, less complex and decreased in mean length of utterance (Snow 1972; Newport, 1977). In terms of prosody and rhythm, mothers' utterances have been found to be higher in pitch, and more intelligible than adult-directed speech. Semantic analyses of maternal input have revealed that language to young children is tied to the immediate non-linguistic context. Further, in terms of vocabulary, mothers most often use concrete words (Cross 1978; Snow, 1972). Studies of fathers' speech to young children have revealed similar findings. In one of the few reported studies analyzing maternal and paternal input to both normal and language impaired children, Stein (1976) reported that parents adjusted their sentence length, grammatical complexity and style in order to adapt to their child's linguistic level. The linguistic level of the young child learning language acts is an important cue as to how the adult modifies the complexity of input.

Researchers have examined the effects of 'motherese' on the language learning system of the young child. Nelson (1973), in her investigation of young normal children, reported significant correlations between certain functional aspects of mothers' speech and several pragmatic and syntactic aspects of language development in children. Nelson's results showed that the proportion of directives, as opposed to comments, correlated negatively with children's acquisition of vocabulary, mean length of utterance, and comprehension of commands. Further, she found that the degree to which the mothers' speech was directive was predictive of the type of style the child used, namely - 'expressive' or 'referential'. From these findings, it appears that the style of maternal linguistic input is crucial to the child's

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subsequent language development.

Cross (1978) analyzed mothers' input to normal children and found significant correlations between certain variables in the mothers' language and various indices of children's speech production and comprehension. The degree to which mothers' utterances were semantically related to the child's immediately preceding utterance had the most significant positive effect on the child's rate of language acquisition. Snow (1979) expanded Cross' study and also found significant positive correlations between semantic relatedness of mothers' speech to the child's verbalizations. Cross and others have concluded that parents function as language teachers. Cross described the so-called 'good language teacher' as those mothers who let their children determine the topics of conversation. In other words, 'good language teachers' attempt to maintain and expand upon their children's self-initiated dialogues by adding information and extending the topic. Specifically, they do not initiate nor change the child's self-initiated topics (Cross, 1978).

Most of the literature in this area has concentrated on only one participant in the dyadic unit. In other words, these studies focus on one member of the dyad (mother and/or child) and analyze the mother's language in isolation from her interactions with her child. In order to more closely understand the effects of modifications of maternal input on the child's output, the bidirectional relationship of this dyadic unit must be studied.

Bloom, Rocissano, and Hood (1976) completed one of the few investigations which looked at bidirectional interactions between adults and young children. In their longitudinal study, the conversational skills of four normal children (19-36 months) were observed in naturalistic interactions. They reported that during the early stages of discourse development, these children were more readily able to produce utterances which were adjacent to an adult's previous utterance (utterances which followed the adult utterance), rather than producing nonadjacent utterances (utterances separated by a definite pause time). Bloom et al. reported that their children found it more difficult to produce spontaneous (or noncontingent) messages rather than related (or contingent) messages. In other words, their children produced more utterances which did not share the same topic as the preceding adult utterance. As the children progressed from Brown's Stage I through Brown's Stage V, they developed the ability to produce more utterances which were linguistically contingent upon previous adult utterances. It is important to note that adult questions were found to facilitate the child's ability to produce linguistically contingent messages.

In terms of language impaired children, limited research is available which describes the nature of adult input to the language impaired child. It has been reported that the verbal environment of

the language-impaired child is different than that of the normal child learning language (Wulbert et al., 1974; Stein, 1976; Cramblit and Siegal, 1977). It must be noted that most studies comparing normal and disordered children match children according to chronological age. Studies that have matched normal and disordered children according to linguistic level (Rondal, 1977) have not found any significant differences in adults' speech.

Cramblit and Siegal (1976) studied the language input of a mother, father, and an aunt to a normal and language impaired child of the same age. They found that the language addressed to the language disordered child was more simplified, repetitive and shorter in mean length of response. In general, the parents talked more with the language impaired child. Stein (1976) found similar results when comparing mothers' and fathers' language to normal and language deficient children of similar ages (3.11 to 5.11 years). The parents of the language deficient children adjusted their sentence length and produced less complex utterances to meet the linguistic needs of their language impaired children.

Rondall (1977) matched normal and mentally retarded children on linguistic level. The maternal linguistic environment of both groups was similar in analyses of quantitative output, lexical, syntactical, semantic, pragmatic, and language-teaching aspects. In other words, when normal and disordered children were matched on linguistic level, parents modified their language in the same way. This may indicate that an important factor in determining the input is not the child's language disorder but the child's language level.

Researchers studying the functions of adult speech to language disordered children have characterized adult input as more directive. Generally, adult speech has more commands and imperatives (Giattino, 1979; Stein, 1976). Further, it has been reported that mothers of language impaired children are often more unresponsive to the child's verbal and nonverbal output (Wulbert et al., 1974). Studies report that much of the language input to disordered children is concerned with getting and maintaining the child's attention (Giattino, 1979; Stein, 1976; Rondal, 1977). A similar emphasis on the child's behavioral patterns has been found in adult speech to younger normal children. For example, Gelman and Shatz (1975) noted that almost half of adult utterances to two year olds directs interactions.

Most of the literature on adult input to language disordered children, similar to the literature on normal children, has analyzed only one participant of the mother-child dyad in isolation from the other. Recent research (Prutting, Bagshaw, Goldstein, Juskowitz and Umen, 1978; Blank, 1979; Seid, Geller and Wollner, 1978) specifies the bidirectional effects of the adult on the child and vice versa. Prutting et al. (1978) analyzed interactions between language clinicians and disordered children. In describing both adult and child communicative

acts, clinicians were found to most frequently make requests. Following this style, the greatest proportion of children's utterances were responses. Most of the literature previously mentioned has analyzed the adults' modifications of their input depending on the linguistic abilities of the child with the exception of Bloom, Rocissano, and Hood (1976). Few studies have attempted to look at this relationship in reverse. In other words, what modifications would children make in their communicative style in relation to varying types of adult input. Blank, Gessner and Esposito (1979) analyzed two parents in their interactions with their language impaired child where the parent-child interactions were analyzed as a bidirectional network. As Blank et al. state, "one is not (only) concerned with the amount and quality of each person's speech, but rather with the degree to which the speech of the two participants meshes so as to form meaningful dialogues". (p.335). Their system of analysis looks at both speaker-initiator and speaker-responder roles for each participant. Their bidirectional analysis revealed that parent responses to their language deficient child were almost always "adequate", whereas the language deficient child provided mostly inadequate responses when the parents were speaker-initiators.

Seid, Geller and Wollner (1978) investigated the nature and type of specific adult input on the output of a five year language-impaired child. These researchers were interested in investigating the relationship between varied types of adult input and the child's output. In experimental contexts, they manipulated the adults' input (adult produced questions, statements, and imitation-expansions) in order to determine the effects of this input on the child's output. The relationship between linguistic and pragmatic aspects of clinician-child discourse was analyzed. Seid et al. (1978) found that the language impaired child produced a greater number of spontaneous (or non-adjacent) utterances compared to responsive (or adjacent) utterances. This was in contrast to the types of utterances produced by normal children at the same linguistic stage of development (Bloom et al., 1976). Further, unlike Bloom's normal children at Brown's Stage I, the language impaired child's production of responsive utterances were mostly contingent upon the clinician's input. In conclusion, this disordered child exhibited conversational skills which differed in comparison to those used by young normal children.

In view of these findings (Seid et al. 1978), the present study was designed to further investigate the language learning environment of this same language disordered child. This present study is an observational investigation which was designed to address specific issues. First, how does a language impaired child adapt to different types of adult input? In other words, does the child's communicative style vary when talking with the mother, father, and clinician. Second, do styles of input differ among adults in their communicative interactions with a language impaired child? Specifically, mother, father, and clinician input was analyzed and compared as to its semantic and pragmatic features. The effectiveness of each adult's style in eliciting more

communicative exchanges from this child was examined.

Method

Subject:

The subject of this study, J., a 6 year old language impaired child, had been attending the Queens College Speech and Hearing Center for three years. She was seen for individual language therapy and also participated in a play group with two other language impaired children.

J exhibited a severe expressive language deficit characterized by the use of three and four word utterances. In addition, J. exhibited a severe phonological disorder marked by omissions and distortions of phonemes. Intelligibility of J's speech was poor. J's pattern of behavior was characterized by hyperactivity and distractability. She was unable to focus on tasks for extended time periods. Results of a neurological evaluation indicated that J exhibited "diffuse neurological impairment on the basis of motor findings and problems with all aspects of higher integrative functions." An audiological exam revealed that J's hearing was within normal limits bilaterally. J was enrolled in a full day class for language impaired children. The goals of language training included expanding expressive language skills, improving conversational abilities and articulation production.

Apparatus:

The experimental procedure was conducted in a 10' by 15' room at the Queens College Speech and Hearing Center. The adult and child were seated at a table during both free play and teaching contexts. One of the experimenters recorded the linguistic and nonlinguistic context during each session while the other experimenter videotaped and later transcribed the verbal and nonverbal recordings.

Stimulus materials for the free play context consisted of a pool of six toys. These were selected on the basis of subject interest and familiarity. The following toys were used during the free play context: a dollhouse with furniture, a set of play dishes, a kitchen set, a musical typewriter, puppets and play-doh. Stimulus materials for the teaching context consisted of toys which could be assembled. They were similar in their complexity and unfamiliar to J. The toys used in the teaching context were: Mickey Mouse statue, Sesame Street Grover statue, an airplane, and a Lego car and two puzzles.

Procedure:

J's communicative interactions were observed with three adult speakers: J's mother, father, and clinician. These interactions were observed for 20 minute time periods within two different contexts:

Context I - free play and Context II - teaching task. During Context I (free play), each adult was seated with J at a table displaying a variety of toys. The adults were instructed to play with J and be as 'natural' as possible in their interactions with her. During Context II (teaching task), the adults were asked to instruct J as to how to assemble an unfamiliar toy. Each interaction was observed for approximately 20 minutes, over two sessions (10 minutes per session). These observations were made over a period of two weeks. Time duration for each condition ranged from approximately 10-15 minutes, depending on the child's behavior. Free play was always followed by the teaching context. A total of 40 minutes of interaction was analyzed between each adult and J.

A variety of semantic and pragmatic analyses were completed. In terms of semantic analyses, Snow's coding system (1979) was modified and applied to these adult-child interactions. This system analyzes the semantic relatedness of maternal input to the child's immediately preceding nonverbal and/or verbal behavior. In other words, Snow looked at contingent adult-child exchanges and coded whether or not the mother's input related to the child's previous action and/or verbalization.

In terms of pragmatic analyses, adult utterances were coded as to their communicative functions. This coding procedure was a modification of the system devised by Geller and Wollner (1976) to examine adult communicative functions (see Appendix). Child utterances were analyzed using Dore's illocutionary act types (1977).

Other pragmatic areas investigated included a modification of Blank's system (1979) for examining adult-child responsiveness. Slight modifications were made in this system. Specifically, nonverbal responses were included as adequate.

Results

J's mean length of utterance was 2.2 and this placed her within Brown's Stage II. J encoded a variety of semantic-syntactic relations which placed her at Phase 2 according to Bloom and Lahey (1978). J. emitted a total of 124 utterances in both contexts. With each adult, J. produced a greater proportion of utterances within the free play context (see Table 1). Looking at total adult and child utterances within both the free play and teaching contexts, J produced the greatest proportion of utterances with the clinician and the smallest proportion of utterances with her father. In terms of formal linguistic measure-

Table 1

Proportion and frequency of utterances for each speaker - free play and teaching contexts

Speaker	Free play	Teaching	Total
Mother	.82 (108)	.85 (91)	.83 (199)
Child	.18 (24)	.15 (16)	.17 (40)
Father	.84 (126)	.85 (133)	.84 (259)
Child	.16 (25)	.15 (23)	.16 (48)
Clinician	.81 (50)	.82 (106)	.81 (156)
Child	.19 (12)	.18 (24)	.19 (36)

ments (in both contexts), it should be noted that the mother's M.L.U. was 5.4, the father's M.L.U. was 5.9, and the clinician's M.L.U. was 3.9. Thus, a range in terms of the length of adult's M.L.U. was observed.

In terms of syntax, analysis of adult utterances according to grammatical sentence types was completed. Table 2 illustrates the sentence types used by each adult within each context. J's mother produced a total of 199 utterances in these two contexts.

Table 2

Proportion of adult sentence types in free play and teaching task contexts

Sentence Type	Mother-Child		Father-Child		Clinician-Ch.	
	Free Play	Teaching	Free Play	Teaching	Free Play	Teaching
Declaratives	.42	.37	.44	.40	.60	.64
Imperatives	.38	.32	.36	.42	.10	.19
Yes-No Questions	.13	.12	.13	.05	.12	.03
Wh Questions	.02	.12	.05	.05	--	.01
Imitation-Expansions	.02	--	.02	--	.08	.01
Other	.03	.07	--	.08	.10	.12

The mother frequently used both declarative and imperative sentence types in both contexts.

In looking at the father's utterances, a total of 259 utterances were used in both contexts. Similarly, the father used declarative and imperative sentence types most frequently in both contexts. One difference was noted between parents. J's father increased his use of questions from .10 utterances in the teaching task to .18 utterances in free play. This was in contrast to the mother's style, where there was a decrease in the use of questions in the free play situation. A minimal number of imitation-expansions were used by both parents. A total of 156 utterances were emitted by the clinician. Similarly, the clinician used a greater proportion of declarative utterances in both contexts, however there was more infrequent use of imperatives as compared to parental input.

In terms of adult communicative functions, Table 3 illustrates adult functions used during the teaching and free play contexts.

Table 3

Proportion of adult communicative functions in free play and teaching task contexts

Type	Mother-Child		Father-Child		Clinician-Child	
	Free Play	Teaching	Free Play	Teaching	Free Play	Teaching
Requests	--	.03	.06	.08	.04	--
Interactional	.89	.30	.70	.35	.28	.32
Teaching	.07	.40	.02	.25	.06	.35
Comments	.03	.01	.16	.12	.40	.14
Responsives	.03	.24	.06	.20	.22	.19

During the teaching context, J's mother used the greatest proportion of utterances which were encoded as Interactional (.30) and Teaching functions (.40). Within the Interactional function, it is important to note that the majority of utterances were directed to getting J's attention. Looking at the mother's style in free play, there was a large increase in the proportion of utterances coding an Interactional function (.88) with a decrease in the proportion of utterances coding a teaching function (.07).

The father's utterances primarily encoded Interactional (.35), Teaching (.25), and Responsive functions (.20). In the free play

context the greatest proportion of utterances coded an Interactional function (.70) with a marked decrease in utterances which coded the Teaching function (.02). Thus, in terms of communicative functions, the father's style was similar to the mother's style. The greatest proportion of utterances within the Interactional function were attention-getting devices. Further, it should be noted that the father continued to encourage the child to play in both contexts, whereas the proportion of the mother's utterances which encouraged J. to play decreased markedly in the teaching situation.

Looking at the clinician's use of functions within the teaching context, the clinician generally encoded a greater range of all communicative functions as compared to the parents. In terms of the clinician's functions during the free play context, there was an increase in proportion of her utterances which encoded the Comment function.

In general, the greatest difference noted between both parents and clinicians was the type of Interactional functions encoded across contexts. Both parents used many attention-getting devices while the clinician did not. It should be noted that the mother used the Comment function quite infrequently in both contexts.

In terms of the Responsive function, there was a marked decrease in the proportion of both parents' utterances acknowledging J's utterances in the free play context as compared to the teaching task. In other words, the parents were more responsive to J's output during the teaching context than during free play. The clinician was equally responsive regardless of the context.

In examining the relationship between form and function, the mother most frequently coded interrogatives which expressed an Interactional function. The father encoded a variety of functions with interrogative forms. The clinician most often used declarative forms which most frequently expressed a Comment function.

J's illocutionary act types fell largely within the categories of Responses, Statements, and Descriptions when interacting with her parents. In J's illocutionary acts with the clinician, most acts encoded Requests, Responses, and Descriptions. J initiated more Requests with the clinician as compared to her parents. J infrequently used conversational devices with any of her conversational partners.

In terms of semantic relatedness, Table 4 illustrates the adult's input in both contexts. Both the mother and father exhibited a low proportion of utterances which were semantically related to the child's ongoing activity and/or preceding verbalizations. Thirty one percent

Table 4

Proportion of semantically related speech in free play and teaching contexts

Utterance Type	Mother-Child	Father-Child	Clinician-Child
Semantically related to child's nonverbal activity	.19	.15	.42
Semantically related to child's verbal activity	.12	.08	.18
Other (self repetitions)	.02	.01	.03
Semantically unrelated to child's activity	.67	.76	.37

of the mother's verbalizations were related, whereas .23 of the father's utterances were related. In contrast, a total of .60 of the clinician's input was semantically related to the child's activities or verbalizations.

We also analyzed the bidirectional effects of adult-child interactions in terms of speaker-initiator and speaker-responder roles (Blank et al., 1979). Since the effects of the contexts were not significant, data for each speaker across contexts was combined. First, both parents used a similar proportion of obliges (which require a response) and comments within each context. The mother produced .40 utterances coding the comment function and .43 utterances coding the oblige function. Similarly, the father expressed .47 utterances coding the comment function and .44 coding the oblige function. In contrast, the clinician presented a greater proportion of comments (.65), than obliges (.19) in both contexts.

J was more responsive after obliges. In other words, she was more responsive after questions and imperatives which required a response. With each adult, J emitted a greater proportion of responses,

which were coded as adequate (or appropriate) and inadequate (or inappropriate) after oblige-type utterances. Generally, with each adult, she emitted more 'adequate' responses after obliges.

The proportion of No Responses after adult obliges was relatively high with both parents (.62 and .47 after the mother's and father's obliges respectively). However, with the clinician, there was a marked decrease in the number of J's No Responses (.18). No responses after comments cannot be evaluated due to the fact that the child is not obligated to respond.

With regard to J. as speaker-responder, her responsiveness was analyzed in free play according to specific grammatical sentence-types. J. emitted more verbal and nonverbal communicative responses after the adults' use of interrogatives. It seemed that questions were the most effective form of adult input in eliciting language from this child. Declaratives produced the next highest proportion of verbalizations. Thus, one can elicit more 'talk' from J. by asking interrogatives and/or making statements.

Additional analysis of J. as a speaker-iniator and each adult as speaker-responder was completed. J's father responded to J's initiations approximately half of the time (.42). For .56 of the time, he was unresponsive to J. J's mother was more responsive in that .68 of the time she responded to J's initiated utterances. The clinician responded to J .96 of the time. Within adult responsiveness, J's mother emitted more adequate (.68) than inadequate (.32) responses. In contrast, J's father emitted more inadequate (.58) to adequate responses (.42) to J's initiations. The clinician adequately responded to J's initiations .96 of the time. Thus, the clinician was most responsive to J's self-initiated verbalizations.

Discussion

Returning to our first research question, our analysis was designed to look at the nature of adult input with a young language impaired child. As stated previously, both J's mother and father were clearly more directive in their interactions with J. This was seen in the parents' frequent use of the Interactional function which was specifically related to maintaining the child's attention. The use of attention-getting devices was prevalent in both contexts. The clinician also used the Interactional function, however, her utterances were coded as encouraging the child's play (see Appendix).

In terms of the relationship between form and function, the parents used imperative and interrogative forms which functioned

primarily to maintain J's attention and direct her to the tasks.

With regard to our initial hypothesis regarding different adult styles, several points can be made. First, as expected, during the teaching context, an increase was seen in the number of utterances which encoded a Teaching function. Further, a decrease was seen in the number of utterances which encoded an Interactional function. Second, in terms of Responsives, the parents more frequently acknowledged J's verbalizations in the teaching context, and were less responsive to her output during free play. The clinician was consistently more responsive to J regardless of the context. Third, in terms of the Comment function, both parents infrequently used this function. In other words, they did not consistently talk about the child's ongoing activities, whereas the clinician more frequently and consistently coded J's activities.

Many studies with language impaired children (most frequently with mentally retarded populations) have stressed the prevalent use of commands and directives in parental input to these children (Marshall et al., 1973; Rondal, 1977; Stein, 1976). This feature has consistently been observed in the maternal input to disordered children and definitely seems to interfere with other types of language stimulation that can be occurring (Nelson, 1973). In looking at maternal interaction in the home, Wulbert et al. (1974) state that the mothers of language-delayed children (as compared to mothers of normal children) primarily meet the physical needs of their children, with limited time spent in spontaneous interactions. Wulbert et al. report that mothers spent a great deal of time supervising and disciplining the disordered child. J's parents followed a similar style in that they were most directive with her and most of their linguistic input involved getting J's attention and directing her activities.

One further point should be made in regard to parental responsiveness to J. Generally, it has been reported that mothers of language impaired children assume a 'tutorial role' when interacting with their children. They seem to focus not only on the child's behavior, but also on teaching specific tasks (Stein, 1976). One could say that J's mother and father had a similar style in their conversations with J. They focused on getting J. to attend to tasks and to behave appropriately, with less emphasis on more spontaneous conversational exchanges.

The area of semantic relatedness was investigated due to recent hypotheses that it appears to be a crucual aspect of the normal child's language learning environment. As Snow (1979) states,

"...children learn language more effectively by experiencing many occasions of correspondence between their own semantic intentions and what they are hearing." (p.9). Our findings in terms of semantically related speech appear to be quite significant.

Following the parents' style of being quite directive in their talk, few opportunities were noted where J. was able to lead and direct communicative interactions. Specifically, the parents infrequently encoded J's ongoing verbalizations and/or nonverbal activity. In other words, the semantic content of their input was not determined by J's ongoing actions. Cross (1978) states that mothers who appear to be 'good language teachers' are those mothers who let their child determine the topics of conversation and consistently follow the child's initiations. We have observed that J's parents did not adopt this style of interaction. This style was quite different than the clinician's style. The clinician produced a greater proportion of semantically related utterances which encoded J's ongoing activities, or were clearly related to her verbalizations. The clinician used many comments (with fewer directives) when interacting with J. This could account for the fact that with the clinician, J. initiated more communicative acts.

The literature on normal children learning language points to the fact that children are not passive language learners. As Bowerman (1978) states, "the child possesses highly effective methods for learning what operates best if he is allowed to control the verbal interactions as much as possible". (p.174). In the clinical setting, we often see a pattern of interaction in which the language impaired child is continually directed to perform in a certain way, regardless of his/her interests at the time. As Bowerman states, "these are exactly the kind of interactions that appear to be least conducive to language development". (p.174). J's parents exhibited this directive style quite frequently in our study.

In terms of our analysis of speaker-initiator and speaker-responder roles, J's parents produced a similar proportion of obliges and comments in both contexts, while the clinician produced many more comments than obliges. These findings are consistent with our linguistic analysis which showed a high proportion of highly directed parental speech. In terms of J's responsiveness to adult input, she was most responsive after obliges. In other words, the adults elicited more verbal and nonverbal communicative acts from J with this type of structured input.

In relating our findings with those of Seid et al. (1978), we observed similar results in terms of J's responsiveness in more naturalistic (as opposed to experimental) contexts. Seid et al. found

that J. was most responsive after adult questions and the results of this study were similar. Bloom et al. (1976) also reported that normal children produced more linguistically contingent speech after adult questions than non-questions. Further, J. was not responsive to adult imitations. In other words, she did not show a tendency to imitate expansions of her own utterances, although the adults infrequently used imitations with J. Perhaps this infrequent use of adult imitations was evidence that the adults knew what strategies were more effective in eliciting language from J.

Seid et al. (1978) found that J. produced a greater proportion of spontaneous (or non-adjacent) utterances rather than responsive (or adjacent) utterances. In contrast, we found that J. produced a limited number of spontaneous verbalizations in these contexts. It is interesting to note the differences in J's style observed in these two studies. This data can be interpreted in different ways. Perhaps the adults' input in this study's contexts provided more forms to which J. was responsive (for example, yes/no questions). Further, these nonlinguistic contexts were more limited in the number of stimuli than in the Seid et al. procedure, limiting J's opportunity to talk about different things and focusing her attention more closely to the task and the adults' input. Further, the frequency of adult input was much greater in the contexts of this study giving J. less opportunity to initiate spontaneous language.

Continuing with this theme, it appeared that the parents' style of input may have clearly limited J's self-initiated output. In other words, the clinician talked less, which gave J. more opportunity to initiate language. With the clinician, J. used more self-initiated verbalizations. It should be noted that her self-initiated utterances mainly consisted of comments (Blank's categories, 1979). Thus, J. emitted few verbalizations that regulated the conversation (use of obliges), and the few obliges emitted were in her exchanges with the clinician.

In summary, continued research is needed in looking at the disordered child's language learning environment. However, we have observed several important characteristic features of these adult-child interactions. First, the parents were quite directive with J. in both form and functions expressed. They did not provide a rich language learning environment for this child. Second, J. did not adapt or change her communicative style with different speakers. She was not significantly more responsive with any speaker. Finally, in terms of semantic relatedness, and the importance of following the child's 'lead', the parental styles observed here were not particularly conducive to J's language learning. This finding has implications for modifications of J's home environment. In order to facilitate J's continued language development, modification of these parent-child exchanges should be considered. Specifically, one might want to reverse the game of follow the leader and teach the parents to be 'followers'.

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Appendix

Adult Communicative Functions

I REQUESTS

A. to give directions (not related to task)
B. to elicit information
C. to clarify child's message
D. to clarify if child comprehends adult's message

II INTERACTIONAL

A. to engage, encourage or join child in play
B. to direct child how to play
C. to get child's attention to activity
D. conversational fillers
E. to suggest activity
F. to engage child in conversation
G. to tease child

III TEACHING

A. use of imitation
B. use of expansions
C. to play the 'name game' (e.g., what is this?)
D. explicit corrections of child's linguistic output
E. to teach child how to manipulate toy/object

IV COMMENTS

A. to describe child's ongoing activity
B. to describe adult's ongoing activity
C. to give information/explanation (without looking for any response)

V. RESPONSIVES

A. to acknowledge child's verbalizations and/or actions (includes verbal approval or disapproval of behavior)
B. to acknowledge child's verbalizations and/or actions and to then redirect child's actions.

Geller and Wollner (1976)

Communication patterns of an autistic child

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Ellenmorris Tiegerman*

Abstract

The purpose of the present study was to determine how verbal-nonverbal changes in adult input affected the communication interaction of an autistic child. An analysis of the child's communicative acts highlighted possible differences for the autistic in the processing of verbal and nonverbal information. The study considers the unique communication pattern of an autistic child as a function of coding specialization to either the verbal or nonverbal systems.

Studies of child language expanded from an interest in grammatical competence to an emphasis on the child's communicative competence (use in context). In investigating whether or not a major function of early language use is social interaction, researchers have attempted to determine how interpersonal contact is established and maintained. Garvey and Hogan (1973) studied the development of social speech in the dyads of normal pre-school children. Social speech was defined as speech adapted to the verbal or nonverbal behavior of a partner. The researchers examined how spontaneous interactions are sustained by a social turn-taking mechanism. As an example of the social use of speech, Garvey and Hogan described how periods of mutual agreement (degree to which children interact or become involved with one another) are sustained. The basis for sustained engagements included games and activity centered on toys or objects in the room, often with accompanying speech. Children spent a considerable portion of their time in social interaction, much of which consisted of speech. This speech, regarded as social behavior, was a means used by children to enter into periods of interaction. The authors concluded that children used speech to achieve social contact. They suggested that early forms of social speech reflect the emergence of interpersonal understanding.

Gallagher and Craig (1978) studied the semantic and conversational aspects of monologues in the speech of normal children. Their investigation described how conversational characteristics of monologue speech compared to contextually matched dialogue speech. The data contained alternations of dialogue with the examiner, and monologues produced during independent self play. Results indicated that the semantic and conversational categories occurring in monologue speech were similar to those that appeared in conceptually matched dialogue speech. Monologue samples however, were shorter than dialogues. The authors suggested that the subjects seemed to resist long separation from a potential conversational partner. Nevertheless, the structural characteristics of monologue speech highlight a basic social interactional pattern which underlies child communication (Garvey and Hogan, 1973; Keenan, 1974; Dore, 1975; Bates, 1976).

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Recent research in the area of adult-child interaction has focused on investigating and determining discourse variables. Early studies of adult-child interaction consistently indicate that listener's must observe certain rules or principles of conversation to maintain discourse. These studies show that participants in conversation observe systematic rules of turn-taking in establishing, maintaining, and occupying their relative positions in dialogue. The knowledge of these rules and the ability to apply them has been referred to as "communicative competence".

Language exists for the purpose of communicating information between speaker and listener (Rees, 1978). Since children learn language within context, speaker/listener discourse should be affected by contextual variables. Keenan (1974) investigated the development of conversation skills in young children. The study focused on the emergence of skills that underlie the exchange of speech between speaker and listener. The author noted that the acquisition of speech is based upon interactional skills. Atkinson (1974) notes that "much of early language is characterized by the function of getting the listener's attention and directing that attention to some object or situational feature." He suggests that as speakers, children at the one-word stage have a variety of vocal-verbal (look! see! uh-ah!) and nonverbal (touching, pulling, eye contact) devices for drawing the attention of the listener.

Blank, Gessner and Esposito (1979) discussed dialogue in terms of the speaker initiating an exchange and/or a listener responding to prior utterance of the other speaker. According to Blank et al. (1979) when a speaker produces an utterance, the dialogue continues only if the listener offers a response (verbal or nonverbal). When appropriate responses are consistently absent, dialogue cannot take place and this represents a serious interference with communication. Viewing comments and questions within a conversational framework, Keenan (1974) indicated that a speaker expects the hearer to acknowledge the utterance. She posits that comments and questions impose an obligation on the listener. In effect, the listener acknowledges that the speaker has addressed an utterance to him. Although many studies of adult-child interaction have been done with normal children, relatively few researchers have investigated communicative competence skills in language impaired children. How does the language impaired child adapt his language to the interactional context and environment?

Blank et al. (1979) investigated the use of language in the interpersonal interaction between an adult and a language impaired child. The researchers attempted to determine the degree to which the speech of the two participants formed a meaningful dialogue. The analysis was based upon each participant's role in the dialogue; the speaker as an initiator and the listener as a speaker responding to a prior utterance of the speaker-initiator. Each verbalization of the speaker-initiator (S-I) was evaluated as to whether or not it contained an explicit demand for the listener to respond. A four-point scale was devised to codify the appropriateness of the speaker-responder's reply (i.e. adequate, inadequate, no response, and other). A matrix was used to judge the effectiveness with which the two participants involved in dialogue maintained effective contact with one another.

The results indicated that the pre-school language impaired child was ineffective in interpersonal communication; the subject's language was not oriented towards a listener. As speaker-responder the child's responses were rarely appropriate to the speaker-initiator's interactions. The researchers noted that the child (as listener) did not attend to the content of the speaker's message and did not attempt to sustain dialogue exchange with the speaker. As speaker-initiator the child acquired verbal language forms which could be described as a set of highly specialized language-based routines tied to specific situations. The authors suggest that the child's difficulties in the use of language for communication were based upon the inability to understand or produce nonverbal communicative forms (i.e., gestures) during infancy. The researchers concluded that the child did not develop communicative interactional skills; the overall picture that emerged was one of language without communication.

According to Bates (1976), the pragmatic functions of verbal utterances may be expressed by means other than speech. Children are successful in communicating messages nonverbally before they have control over verbal language. Bates concluded that origins of speech acts are at a stage earlier than the emergence of recognizable spoken language. Bates, Camaioni, and Volterra (1975), traced the development of performatives to three children's communicative intentions in the pre-speech period. They found that certain performatives did occur pre-linguistically through the use of gesture and nonverbal/vocal signals. Other investigators have also recognized that the child's mastery of communication does not begin with the first word (Garvey and Hogan, 1973; Rees, 1975).

The present investigation examines adult-child discourse within a communication framework. The purpose was to determine whether variations in adult input affected the communication interaction of a language impaired child. The child's communicative acts (verbal and nonverbal) were analyzed in relation to an adult's communicative acts (verbal and nonverbal) during play interaction.

Method

Subject:

The subject, K., was a 5.10 year male. K has been enrolled for language therapy at the Queens College Speech and Hearing Center for three years. K exhibited a severe expressive speech and language disorder. A psychiatric evaluation resulted in the diagnosis of infantile autism. Behavioral characteristics indicated that K did not attend to tasks, avoided eye contact and physical contact, and self stimulated (i.e. hand-flapping, twirling and spinning objects). The subject exhibited other performances often associated with infantile autism: toe-walking, echolalia, glazed-stare, temper tantrums, and routinized response patterns. The developmental history revealed a delay in social skills and language development. K was able to identify a limited number of common objects. Expressive forms were basically

imitative in nature; spontaneous productions were single-word request forms. An audiological examination revealed K's hearing to be within normal limits bilaterally.

Over time, the behavioral goals of K's therapeutic intervention program included the establishment of eye-contact, development of interactional type play and reduction of ritualistic behavior patterns. Language therapy attempted to expand and develop K's semantic and syntactic functions. Content categories trained included recurrence, location, possession and negation. Constructions were action + object, agent + action and agent +action + object. All utterances were trained within a variety of natural play contexts. Pragmatic intentions trained were request and comment functions of language.

Apparatus:

The experimental procedure was conducted in a 10' x 12' room at the Queens College Speech and Hearing Center. The subject and the experimenter were seated adjacent to each other at a small table while the clinician presented the stimulus materials. Audio-visual tapes were made by a second experimenter. To establish reliability, these tapes were subsequently transcribed and analyzed by both experimenters. In addition, an observer was present during all experimental sessions to record the linguistic and nonlinguistic context. The sessions were presented within a naturalistic play context. The room was cleared except for those stimulus items necessary to create the contexts. Stimulus materials consisted of a pool of fourteen toys: truck, basketball and hoop, mail-box, blocks, piano, bubbles, stack toy, dollhouse, fire engine with firemen, plane, rocket, push toy, bell and toy animals (lamb, monkey and elephant).

Procedure:

In order to investigate the relationship between the communicative form of the adult interaction and the child's verbal/nonverbal response, two experimental conditions were presented. There were a total of seven experimental sessions conducted over a three week period; each session thirty minutes in length. Conditions were randomly presented during each session.

Condition I: In Condition I, the adult presented intermittent verbal communicative acts. This Condition included three categories of adult verbal input: simple questions, imitation-expansions and comments. The adult's communicative intention was to elicit a response from "what", "where" or "who" questions. Comments were presented as active affirmative declaratives of observable aspects of objects, events and participants in the ongoing interactions. Imitation-expansions were defined as any partial or complete repetition of the immediately preceding child verbalization. The adult's imitation-expansion shared at least one word with the child's utterance, but did not add more than four lexical items. Whereas questions and comments were initiated by the adult, the imitation-expansions were dependent on the child's initiation

of an utterance. Five toys were presented, one at a time. The child was given an opportunity to explore each toy before the adult verbal input. In order to maintain a naturalistic communicative discourse during the verbal condition, the adult used social fillers (e.g. "good", "right") and conversational markers (e.g. "uh huh", "okay").

Condition II: In Condition II, the adult used nonverbal communicative acts. In this Condition, the adult's communicative input consisted of natural gestures. The form of nonverbal communicative acts included points and natural gestures. In terms of function, the adult's communicative intention was to direct the child's attention, to engage the child in play, to request an object or to direct the child's behavior. Five toys were presented, one at a time, in the nonverbal condition. The child was given an opportunity to explore each toy before the adult-child interaction was initiated. The adult used conversational markers (e.g. "uh huh", "okay") and social fillers (e.g. "good", "right").

All adult verbal communicative acts and nonverbal communicative acts were analyzed within a communication matrix adapted from Blank et al. (1979). The matrix presented the child as speaker/listener; a speaker initiating an exchange and a speaker responding to a prior utterance of the other speaker. In any dialogue, K could function at varying times as speaker-initiator or as a speaker-responder. The speaker-initiator's utterances were divided into obliges (utterances which required a response from the other participant) and comments (utterances that did not explicitly require a response from the other participant). The speaker-responder's role was to offer a response (verbal or nonverbal) that was appropriate to that prior utterance.

The following interactional variables were analyzed across the two adult input conditions:

a) the number of nonverbal communicative acts produced by the child in each condition,
b) the type of nonverbal communicative acts produced by the child in each condition,
c) the number of verbal communicative acts produced by the adult in each condition,
d) the number of verbal communicative acts produced by the child in each condition.

Results

The number of child verbal communicative acts produced within the verbal condition was compared to the number within the nonverbal condition. K produced a total of 270 verbal communicative acts in the verbal condition and 184 verbal communicative acts in the nonverbal condition. The number of nonverbal communicative acts produced by the child in the verbal condition was compared to the number of nonverbal communicative acts produced during the nonverbal condition. K produced

a total of 73 nonverbal communicative acts during the verbal condition and 115 nonverbal communicative acts during the nonverbal condition.

Table 1 illustrates the type and number of nonverbal communicative acts produced by the child during the verbal and nonverbal conditions.

Table 1

Number and types of nonverbal communicative acts: Child

	Verbal Conditions	Nonverbal Conditions
Takes	30	36
Protests	18	36
Requests	11	12
Withholds	5	6
Body Turns	3	20
Head Turns	1	3
Offers	3	0
Points	2	1
Head Shakes	0	1
Total	73	115

The type of nonverbal communicative acts produced by K included the following: takes, protests, requests, withholds, body turns, head turns, offers, points and head shakes. These gestures were initiated by K to express a variety of communicative functions (i.e. direct attention, maintain or engage in play, direct behavior and request action or object). Takes and protests were used most frequently to express a variety of communicative functions during the verbal and nonverbal conditions.

Comparisons were made between the adult-child communicative acts during the different conditions. The adult produced a total of 577 verbal communicative acts compared to K's 270 verbal communicative acts. The adult produced a total of 226 nonverbal communicative acts compared to K's 115 nonverbal communicative acts. Within the verbal condition, K produced a total of 270 verbal communicative acts compared to a total of 73 nonverbal communicative acts during the verbal condition. Within the nonverbal condition, the child produced a total of 184 verbal communicative acts and 115 nonverbal communicative acts.

The communication matrix showed the general pattern of performance by the child in relation to the adult. The data shows that K as speaker-initiator did not use obliges and occasionally used comments. The adult's responses to K's initiations of comments were frequently adequate (the response met, extended or appropriately elaborated on the speaker-initiator's verbalization). Results indicated that the adult responded adequately 54% of the time, used 31% other responses (a response offered but unclear or ambiguous) and made no response (failure to respond to the speaker-initiator's verbalization) 15% of the time.

In terms of the child responding to adult obliges, the data suggest that K failed to respond to 40% of the instances. K responded adequately 35% of the time, inadequately (a response offered, but invalid, irrelevant or insufficient to meet the constraints established by the speaker-initiator's utterance) 19% and made other responses to adult obliges 6% of the time. K failed to respond to 61% of adult comments. K occasionally commented about the materials, but the verbalization was irrelevant to the adult's prior utterance. K responded inadequately and made other responses 12% and 8% of the cases respectively. An example of this occurred in the context of ball playing. The adult uttered "bounce the ball". K replied "monkey jump", "lion" and "butterfly" (four times). In other instances K responded with episodes of jargon.

Interestingly, K appeared to ignore the content of the adult's verbalizations (61% to comments and 40% to obliges), however, he relied upon the adult to initiate the conversation. If the adult did not talk, K became upset (e.g. temper tantrums), restless (e.g. stood up, looked around the room) or used repetitive phrases in an effort to restore the exchange. K became upset 52 times, restless 44 times and produced repetitive phrases 21 times during the nonverbal condition. K produced 10 inappropriate utterances to trigger interactions. The following is an example of one such episode: the adult and child were interacting with a bell. K verbalized "Robin ring a bell" (4 times), "clap hands", and finally "Robin ring a bell" (11 times).

Discussion

The present study examined the relationship between adult-child discourse within a conversational framework. It is suggested that research should continue to investigate the nature of the impaired child's communication interaction in terms of the relationship between communicative input and the child's communicative output.

The first issue explored in the present study concerned the nature of verbal versus nonverbal adult communicative input. The questions raised included the following: 1) when the adult communicative input is verbal, does the child respond verbally or nonverbally, and 2) when the adult communicative input is nonverbal, does the child respond verbally or nonverbally?

Within and across the two experimental conditions, a greater number of K's productions were verbal acts and those verbal acts occurred during the verbal condition. The child was more communicative when the adult was verbal than when the adult was nonverbal. The child relied upon the adult to initiate verbal interaction. The data indicates that the child's acts were used to express a limited number of communicative functions. K's verbal acts requested action or objects and his nonverbal acts functioned as a means for protest. In contrast, the normal child uses a variety of communicative functions, with each function expressed by a range of verbal and nonverbal forms. This language disordered child expressed each communicative function with a specific verbal or nonverbal form.

The authors posit that the child's pattern indicates a difference in the information coded verbally and nonverbally (i.e. functions coded verbally do not have nonverbal counterparts). Developmental information is needed to determine whether the normal child evidences coding specialization or coding assignments to the verbal or nonverbal systems. The unique language pattern of the autistic child might suggest the following: 1) the assignment of specific communicative functions to each system (verbal or nonverbal) and/or 2) the existence of two coding systems that are functioning independently of each other rather than interdependently. Thus, the autistic child might be processing verbal and nonverbal information in different ways. This premise lends support for the theories which identify underlying deficits in cross-modal processing. Such processing difficulties might affect the integrative mechanism of language across communicative forms and functions during early development. The resulting fragmentation in developmental processes or systems might explain the Blank et al. (1979) description of the autistic child's "language without communication" as language without integration.

Analyzing K's role as speaker-responder it was noted that the child generally failed to respond to the adult communicative input. K ignored or could not respond to the adult's communicative initiations. In addition, he did not attempt to sustain dialogue exchange with the adult. Communicative skills include the capacity to interpret the mood and intent of others, and the need to maintain sustained and related contact with other people. The data suggest that in terms of these communicative skills, K was unable to function as speaker-responder and speaker-initiator because his language was not oriented towards the listener. Thus, the present researchers suggest that the child's utterances, whether as responses or initiations, highlighted delayed development in communicative interaction.

In terms of K's communicative interactional skills, the data suggest that the child lacked social skill functioning and was inattentive in listening to the adult. This finding seems to be reflected in the child's inability to use language for the purposes of communication. The overall picture that emerged was one of language without communication within verbal and nonverbal systems. Thus, this impaired child's

communicative interactional skills indicated a pattern of development different from that of the normal child.

This study highlights the need for further research into the communicative development of language impaired children. Experimental approaches must consider how verbal and nonverbal communication systems develop interdependently, and independently in normal and disordered populations.

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Children's perception of sequenced pitch patterns

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Abstract

The present study was concerned with the acquisition of further normative data for the Pitch Pattern Sequence Test. Thirty children ranging in age from six to eleven years were divided, based on age, into three groups, each containing ten children. All subjects had pure tone averages of fifteen decibels or better in both ears, normal IQ and mental age scores on the Peabody Picture Vocabulary Test, and were right side dominant as assessed by the Edinburgh Handedness Inventory as adapted by Oldfield. Hummed and manual response scores were obtained for each ear. Results revealed that mode of response significantly affected scores for each group. Manual responses were poorer than hummed responses. Ear effects were not significant. Maturation effects were significant for acoustic reversals when a manual response was required. All other analyses did not demonstrate a significant maturation effect. A greater percentage of acoustic reversals was observed when a manual response was required than when a hummed response was necessary.

Halperin, Nachshon and Carmon (1973) demonstrated that the left hemisphere specializes in the processing of temporal patterns. It was also suggested that the perception of verbal stimuli might be associated with the sequencing analysis of acoustic stimuli. It has been demonstrated that right handed subjects recognize digits faster with the right ear, but recognize nonverbal stimuli faster with the left ear (Touwen, 1971). Robinson and Solomon (1974) suggested that rhythmic patterns are processed better by the same hemisphere that is responsible for speech stimuli. Their results are in agreement with Halperin, Nachshon and Carmon (1973) in that temporal patterns as well as speech stimuli are processed by the left hemisphere. The results of Swisher and Hirsch (1972) have shown that right brain damaged subjects required excessively long intervals to respond to various pitches. This was not noted in patients with left hemispheric damage. It was concluded that the left hemisphere is involved with perceptual integration of events, while the right hemisphere participates in the analysis of tonal stimuli. Gordon (1970) has suggested that the left hemisphere may dominate in perceptual analysis in which verbal analysis is involved in the processing of the stimulus. Nebes (1971) demonstrated a left hand advantage for part-whole matching tasks. It was concluded that this was reflective of right hemisphere superiority for this task. Spellacy (1970) investigated the perception of three components of music: temporal patterns, frequency patterns and timbre. A significant left ear advantage was noted. These results are in agreement with Kimura (1964). Among the three components of music analyzed, frequency was considered to be responsible for ear preference.

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By varying the inter-stimulus interval time, it was shown that ear preference was related to short term memory. Massaro (1972) suggested that for auditory patterns of form, rhythm, and melody, organization becomes important at the level of synthetic memory.

In comparing auditory perceptual abilities of learning disabled children with those of normal children, Senf and Freundl (1971) showed that learning disabled children are deficient in ordering stimuli. Stubbefield and Young (1975) demonstrated that for normal children familiarity with a task resulted in a decrease in the number of errors. Learning disabled children, however, maintained the same error rate regardless of familiarity. Beaumont (1976) suggested that the less clearly defined laterality observed in learning disabled children may result from an increase in time necessary for transcollosal transfer or a breakdown in information in this transfer. This may be indicative of a lack of interhemispheric interaction in these children.

In an attempt to study auditory perception using nonverbal stimuli, Pinheiro and Ptacek (1971) claimed that the acoustic properties of speech could be reduced to the following components: duration, frequency and intensity. Frequency and duration were held constant, while the relative intensity of noise bursts were varied. It was shown that the number of correct responses decreased as the difference between stimuli decreased. The number of acoustic reversals, the exact opposite of the pattern presented increased, as the number of errors increased. No learning effect was observed in this process. Ptacek and Pinheiro (1971) showed that the right ear reversed more than the left ear in right side dominant subjects.

Pinheiro (1976) studied auditory pattern perception in patients with left and right hemispheric lesions. Patterns of stimuli were presented in which intensity, frequency and duration were varied alternately. Patients with unilateral lesions performed significantly poorer than normals. This is in agreement with Swisher and Hirsch (1972). Patients with right hemispheric lesions performed the poorest. It was suggested that patients with right hemispheric lesions had difficulty recognizing the pattern, while patients with left hemispheric lesions had difficulty sequencing the patterns correctly. Similar results were noted by Halperin, Nachshon and Carmon (1973) and Nebes (1971). It was also shown that patients with left hemispheric lesions and normal subjects reversed a significant proportion of patterns, however, patients with right hemispheric lesions did not.

Pinheiro (1977; 1978) evaluated auditory processing in learning disabled children. Patterns consisting of three pure tones varying in frequency were presented monaurally. Results indicated that learning disabled children were able to hum the patterns correctly, but scored just above chance level when a manual response was required. It was suggested that these results were reflective of a dysfunction in sensory motor interaction. A maturation effect was demonstrated but an ear

effect was not shown. It was also found that normal children reversed more patterns than learning disabled children. This is in agreement with Pinheiro (1976) in that patients with hemispheric lesions reversed very few of the patterns presented.

The purpose of this study was to obtain additional normative data from the Pitch Pattern Sequence Test (Pinheiro, 1977, 1978). It is hoped that this test may be of diagnostic value in differentiating learning disabled children from normal children. It is especially useful with children, since it is a nonverbal test which may be presented monaurally. It is intended to measure auditory perception as well as temporal sequencing. It allows for a comparison between two modes of response, which may be reflective of interhemispheric interaction.

Method

Subjects:

Thirty children ranging in age from six to eleven years served as subjects. All children were in normal classroom settings. Subjects were grouped based upon chronological age. Group I consisted of children six to seven years old; Group II consisted of children eight to nine years old; Group III consisted of children ten to eleven years old. Each group consisted of ten children. All subjects were right side dominant, had pur tone averages of fifteen decibels or better in each ear, and had IQ scores and mental ages in accordance with chronological ages.

Apparatus:

Pure tone thresholds were measured using a Beltone Portable Audiometer Model 10D. Stimuli were presented via TDH-39 earphones with MX 41 AR cushions. The Pitch Pattern Sequence Test was presented using a reel to reel tape recorder, AKAI GX-4000D. Stimuli were presented via one TDH-39 earphone with an MX 41 AR cushion. The intensity levels of the presentation of the Pitch Pattern Sequence Test were calibrated using a Bruel and Kjaer Sound Level Meter Type 2203 with an NBS 9A earphone coupler. Groups I and II were presented with the children's version of the Pitch Pattern Sequence Test, while Group III was presented with the adult's version of the Test. All testing was performed in a quiet environment.

Procedure:

A pure tone audiogram was obtained for each subject. The Edinburgh Handedness Inventory as adapted by Oldfield (1971) was administered to determine lateral dominance. The Peabody Picture Vocabulary Test was administered and an IQ score and a mental age were obtained for each subject.

The Pitch Pattern Sequence Test was presented monaurally at 50dBSL re: PTA. The subject was first presented with tone pairs to practice discriminating between high and low. A hummed score and a manual score were obtained for each ear. The tape consisted of one hundred twenty pitch pattern sequences, each consisting of three tones. The frequencies were 1430 Hz and 880 Hz. The on time was 500 msec. for the children's version and 200 msec. for the adult's version. The rise/fall time was 10 msec. The interburst interval was 300 msec. for the children's version and 150 msec. for the adult's version. The response interval was 10 msec. for the children's version and 7 msec. for the adult's version. Each pattern consisted of three tones: two of one frequency and one of the other. The following were the six possible combinations: HIGH-LOW-HIGH; HIGH-LOW-LOW; LOW-LOW-HIGH; HIGH-HIGH-LOW; LOW-HIGH-LOW; LOW-HIGH-HIGH. First each subject was instructed to hum the sequences presented. Sixty sequences were presented to each ear. Then the tape was repeated, and the subject was instructed to respond manually. Each subject was told to point to a tall red block in response to the high tone and to a small red block in response to the low tone. Again, sixty patterns were presented to each ear.

Results

Percentages of correct responses and of acoustic reversals were calculated for each ear under each response condition. Acoustic reversals were not counted as errors. The first ten sequences presented to each ear were not scored to account for a learning effect. Mean percentage scores and standard deviations were then obtained for each group, as illustrated by Tables 1 and 2.

Table 1

Mean percentages and standard deviations of correct responses for each group under each condition

	GROUP I		GROUP II		GROUP III	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Hummed: Right Ear	93.6	8.42	91.8	17.66	94.6	6.39
Hummed: Left Ear	94	9.77	96.2	11.40	94.6	5.87
Manual: Right Ear	78.6	16.12	86	15.72	88	14.33
Manual: Left Ear	83.4	14.04	88	18.97	91.2	11.35

Table 2

Mean percentage scores and standard deviations were calculated for acoustic reversals under each condition

	GROUP I		GROUP II		GROUP III	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Hummed: Right Ear	3.8	7.71	2.4	3.76	2.4	3.97
Hummed: Left Ear	4.2	4.55	2.6	5.31	2.0	4.19
Manual: Right Ear	27	23.90	18	11.17	21	15.36
Manual: Left Ear	34	25.60	19.4	13.23	19	12.36

Analysis of variance revealed neither age nor stimulus ear to be significant factors in the correct scores for the hummed or manual response among the three groups. Differences between the two modes of response were significant beyond the .05 level of confidence when the right ear was stimulated. Differences in these scores due to maturation effects were not found to be significant. When the left ear was stimulated, the difference in scores due to the mode of response was again significant beyond the .05 level of confidence. Differences due to maturation effects were not found to be significant.

Analysis of variance was also used to evaluate acoustic reversals. When hummed scores were analyzed no significant differences due to maturation effects or stimulus ear were revealed. When manual responses were evaluated, differences in scores due to maturation effects were significant beyond the .05 level of confidence. Ear effects were not found to be significant. Analysis of the hummed and manual responses for the right ear, revealed differences between the two modes of response to be significant beyond the .01 level of confidence. Maturation effects were not found to be significant. When the hummed and manual responses for the left ear were analyzed, differences between the two modes of response were also found to be significant beyond the .01 level of confidence. Differences among age groups were not found to be significant.

Discussion

Based upon these results, it can be concluded that maturation effects and ear effects were not significant for the hummed response or the manual response when correct scores were analyzed. Modes of response, however, did have a significant effect upon performance. Manual scores were significantly poorer than hummed scores. These differences were not significantly affected by maturation.

Results also suggest that acoustic reversals followed a pattern similar to that of correct responses. Ear effects were not found to be significant for either the hummed or the manual responses. Acoustic reversals differed from correct scores in that significant differences due to maturation factors were shown when manual right and left scores were evaluated. This was the only analysis which demonstrated a significant difference in scores due to maturation. Group I reversed more patterns than Groups II or III when the manual response was required. Based upon the analysis of acoustic reversals, it can be concluded that differences in scores due to mode of response were significant for each ear. A greater precentage of reversals was observed when the manual response was required than when the hummed response was required. These differences in scores did not change significantly across age groups.

Normal subjects performed well on this test. Mean scores of each group for the hummed response were above 90%. Scores for the manual response ranged from 78.6% to 91.2%. Although manual scores were lower than hummed scores, mean scores indicated that these subjects performed fairly well on the manual task. Standard deviations indicated a great deal of variability in scores within all groups. Although differences between groups have been shown not to be significant, individual scores covered a wide range. This was especially true for the manual scores.

Results suggest that ear effect was not a significant factor for either the hummed or the manual response, nor was there a significant ear effect across age groups. These results are in agreement with Pinheiro, (1977, 1978). Contrary to previous research (Pinheiro, 1978), chronological age did not significantly affect performance.

The only analysis which revealed a significant maturation effect was when the right and left ear manual responses were analyzed across the three groups for acoustic reversals. These results demonstrated that Group I, six and seven year olds, reversed a larger percentage of sequences than Group II or III. Group I also demonstrated the greatest variation in percentages of acoustic reversals with the manual response, as was evidenced by the large standard deviation in scores for this group.

Significant differences were noted between modes of response for both correct scores and acoustic reversals. It has been shown that learning disabled children hum the patterns normally but score just above chance level when the manual response was required (Pinheiro, 1977; 1978). While normal children scored fairly well on the manual response, significant differences were noted between the two modes of response. Only one child in Group II, eight and nine years of age, scored poorly on hummed and manual responses for both ears. The poorer scores observed when the manual response was required may be reflective of the difficulty of the task. These children did not have a problem perceiving the pattern, but did have some difficulty

sequencing the pattern correctly.

All groups reversed a greater percentage of patterns when a manual response was required than when a hummed response was necessary. This is in agreement with Pinheiro 1978, who has suggested that for the manual response the pattern is recognized in the right hemisphere, but the left hemisphere confuses the temporal order.

It is hoped that these normative data may increase the diagnostic significance of results obtained using the Pitch Pattern Sequence Test. One factor which may be considered in future studies is the length of the children's version. It was observed that normal children became extremely fatigued by the conclusion of the test session. The effect this possible lack of alertness may have on performance should be considered.

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Appendix

Hummed and manual response scores for each ear on the Pitch Pattern Sequence Test.

Group I

Subject	Age	Sex	Hum AD	Hum AS	Manual AD	Manual AS
1	6	M	100%	100%	90%	56%
2	6	M	98%	100%	76%	74%
3	6	M	96%	94%	98%	100%
4.	6	F	72%	90%	98%	98%
5	6	F	86%	72%	48%	82%
6	6	F	100%	96%	72%	78%
7	7	F	90%	90%	64%	70%
8	7	F	100%	100%	100%	100%
9	7	F	96%	98%	74%	80%
10	7	F	98%	100%	66%	96%

Group II

Subject	Age	Sex	Hum AD	Hum AS	Manual AD	Manual AS
1	8	M	100%	100%	74%	84%
2	8	M	96%	100%	88%	92%
3	9	M	96%	100%	88%	98%
4	9	M	86%	100%	94%	84%
5	9	M	100%	100%	96%	98%
6	8	F	100%	100%	100%	100%
7	8	F	100%	100%	100%	100%
8	9	F	100%	100%	78%	90%
9	9	F	40%	62%	46%	34%
10	9	F	100%	100%	96%	100%

Group III

Subject	Age	Sex	Hum AD	Hum AS	Manual AD	Manual AS
1	10	M	84%	92%	88%	92%
2	10	M	90%	92%	66%	60%
3	11	M	100%	100%	100%	98%
4	11	M	100%	100%	100%	98%
5	11	M	100%	100%	58%	94%
6	10	F	98%	94%	90%	86%
7	10	F	86%	82%	82%	88%
8	10	F	100%	98%	100%	96%
9	11	F	88%	88%	98%	100%
10	11	F	100%	100%	98%	100%

Reversal scores of hummed and manual responses for each ear on the Pitch Pattern Sequence Test.

Group I

Subject	Age	Sex	Hum AD	Hum AS	Manual AD	Manual AS
1	6	M	0%	0%	24%	44%
2	6	M	0%	0%	30%	26%
3	6	M	0%	8%	92%	80%
4	6	F	22%	12%	18%	4%
5	6	F	16%	12%	8%	78%
6	6	F	0%	4%	36%	24%
7	7	F	0%	0%	20%	34%
8	7	F	0%	0%	0%	0%
9	7	F	0%	6%	14%	22%
10	7	F	0%	0%	28%	28%

Group II

Subject	Age	Sex	Hum AD	Hum AS	Manual AD	Manual AS
1	8	M	6%	16%	36%	44%
2	8	M	0%	0%	18%	18%
3	9	M	0%	0%	10%	24%
4	9	M	8%	0%	38%	32%
5	9	M	0%	0%	24%	26%
6	8	F	0%	0%	4%	0%
7	8	F	0%	0%	6%	6%
8	9	F	0%	0%	20%	28%
9	9	F	10%	10%	14%	12%
10	9	F	0%	0%	10%	4%

Group III

Subject	Age	Sex	Hum AD	Hum AS	Manual AD	Manual AS
1	10	M	10%	14%	12%	16%
2	10	M	0%	0%	28%	28%
3	11	M	4%	0%	4%	0%
4	11	M	0%	0%	4%	6%
5	11	M	0%	0%	58%	26%
6	10	F	0%	0%	50%	44%
7	10	F	10%	4%	36%	36%
8	10	F	0%	0%	32%	20%
9	11	F	0%	2%	10%	10%
10	11	F	0%	0%	4%	4%

The role of verb aspect in training a grammatical morpheme

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Abstract

The semantics of verb aspect (temporal contour of events named by particular verbs) has been found to be the major factor governing the emergence of the verbal auxiliary in normal language. This study utilized an observational learning procedure in training the past tense morpheme to a language-impaired child whose performance was studied longitudinally. Results showed that verb aspect was not the main factor contributing to production of the morpheme. Additional contributing factors are identified and clinical implications are discussed.

The acquisition of grammatical morphemes by normal and language impaired children has been investigated by several researchers. Berko (1958) and Cazden (1969) found that normal children developed grammatical morphemes in a uniform systematic order. In a longitudinal study, Brown (1973) described the acquisition of grammatical morphemes by three normal children. deVilliers and deVilliers (1973) in a cross-sectional study, examined the spontaneous speech of twenty-one normal children. The findings of these studies correlated with those of Berko (1958) with regard to grammatical morphemes.

Johnston and Schery (1976) examined the use of grammatical morphemes by two hundred eighty seven linguistically deficient children, ranging in age from approximately three to sixteen years old. They found an invariant order of acquisition of grammatical morphemes similar to that found by Brown (1973). Upon closer examination of the data, Johnston and Schery observed that the language deficient children's use of grammatical morphemes differed in the rate at which they were acquired. Their study demonstrated that language deficient children's use of the past tense morpheme parallels that of younger normal children.

The above studies investigated children's acquisition of all fourteen grammatical morphemes including the inflectional forms of the verbal auxiliary (present progressive-ing, third person singular -s, regular past tense -d, -t, -ed, and irregular past tense). "The implications of these studies are that grammatical morphemes are learned sequentially and that, once acquired, they apply, in general, to all of the child's verbs" (Bloom, Lifter and Tanouye, 1978, p.3). Brown (1973), however, proposed the existence of two verb categories - process and state verbs, and suggested the possibility that different grammatical morphemes may be learned for different verb categories.

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Bronckart and Sinclair (1973) experimentally studied the use of French verb forms by seventy four normal children. The subjects were required to describe action tasks which differed on the following three parameters: frequency of the action, duration of the action (6½-15 seconds), and type of result (whether the action reached a specified goal). It was found that the subjects' choice of verb form was influenced by the type of result which terminated the action. Specifically, the authors found that actions that obtained a clear result were generally described in the past tense, while actions which did not lead to definite result were described in the present tense. Similarly, Antinucci and Miller (1976) examined the acquisition of the inflectional forms of the verbal auxiliary by Italian and English speaking normal children. They found that the past tense morpheme was first acquired with verbs that resulted in a specific end state in both languages. These studies illustrated that when a verb inflection is first acquired, it is not affixed to all categories of verbs simultaneously.

In accordance with this principle, Bloom, Lifter, and Tanouye (1978) examined the emergence of the inflectional forms of the verbal auxiliary (present progressive -ing, third person singular -s, past tense -t, -d, -ed, and the irregular past tense) in four normal children. They investigated the relationship between the semantic organization of verbs used by children and the emergence of the inflectional forms of the verbal auxiliary. The authors found verb aspect to be the major factor that governed the emergence of the verbal inflections. Aspect was defined as the temporal contour of particular events named by particular verbs, (e.g. action that is momentary versus action that is continuous). Thus, they proposed two verb categories: durative and nondurative. Durative verbs were described as events which were carried out over an unspecified amount of time and had no immediate or clear end result (e.g. run). Nondurative verbs were described as events which were momentary and had a relatively clear end result (e.g. break). One important finding of their study was that the past tense marker was used first with nondurative verbs. The results of these studies support the principle of aspect before tense in emergence of verbal inflections. In other words, the children's use of verbal inflections (e.g. past tense) was dependent on the 'aspect' of the verb rather than its temporal value (past vs. present action).

The manner of presenting material is important in facilitating the development of language structure. The basic tenet of social learning theory is that normal children learn language through observation. The child observes multiple occurrences of the rules within the language, and is not required to imitate as he observes (Bandura, 1969). Furthermore, it has been hypothesized that if the child is required to verbalize, the verbalizations may interfere with his ability to learn the rules of the language (Zimmerman and Bell,1972).

Many researchers have found that modeling is an effective procedure for modifying normal and language disordered children's use of syntactic constructions. Carroll, Rosenthal, and Brysh (1972) reported that the use of a modeling procedure facilitated the acquisition and generalization of three verb tenses by normal disadvantaged Mexican American children. Courtright and Courtright (1976) employed modeling and mimicry procedures in the management of eight grade school language deficient children, who ranged in age from five to ten years old. Their data supported the notion that modeling was more effective than mimicry in facilitating the acquisition and generalization of a grammatical construction. Brodey, Laney, and Combs (1978) compared the results obtained in an observational learning study in which the model was constant to results obtained in more naturalistic settings where the model was present intermittently. The authors trained descriptive adjectives to three groups of four to five year old normal children under three conditions. In condition one a constant model was present, in condition two the model was intermittent (50%), and in a control group no model was present. The authors found that the subjects in condition one and two did equally well, and significantly better than subjects in the control group. This data lent support for observational learning using a model in the clinical setting.

The use of televised models as a means of instruction has been investigated. Ball and Bogatz (1972) studied normal and preschool children who watched "Sesame Street". They found that, "all children who watched the program showed a marked improvement in a variety of cognitive skills" (p.15). They also found that improvement was proportional to the frequency with which the children watched the show. Rosenbaum and Lasky (1979) presented a televised model to train conversational skills to a five year old language delayed child and concluded that videotaped modeling was an effective training procedure.

The present research utilized Bloom, Lifter, and Tanouye's (1978) findings in training with a televised model, the production of the past tense morpheme. The purpose of the study was to determine whether the language disordered child's acquisition of the past tense morpheme would follow the developmental pattern found for normal children, that is, acquisition of the past tense marker on nondurative before durative verbs.

Method

Subject:

The subject, T., was a seven year old female who had received language therapy at the Queens College Speech and Hearing Center for three years. At the initial interview, T. was diagnosed as a language impaired child with a mild articulation problem. Her parents reported normal developmental milestones and an unremarkable medical history.

T's hearing was found to be within normal limits bilaterally. T's primary deficit was in the area of syntactic and morphological development.

Prior to the onset of the experimental condition informal language sampling procedures revealed that T. omitted the past tense morpheme in obligatory contexts, had difficulty in the production and comprehension of wh-questions, omitted the copula, and displayed difficulties in pragmatic skills. Her mean length of utterance (M.L.U.) was 3.71. Formal testing, included the Peabody Picture Vocabulary Test which indicated that T. was functioning receptively at age level. The Fisher-Logemann Test of Articulation revealed that T. had normal articulation.

T. was enrolled in a second grade class within the public school system, and did not receive any special services. T. was functioning adequately in this placement, however, she remained deficient in language related skills (e.g. spelling and reading). At home, T. was reportedly a cooperative and helpful child.

Apparatus:

The experimental procedure was conducted in an 8' x 10' room at the Queens College Speech and Hearing Center. Three clinicians were present throughout the training procedure. Data was both audiotaped and hand recorded. Equipment used for the training procedure consisted of a Sony KV-2101 3/4" video deck with color monitor. Reinforcers were assorted games and prizes. Stimulus materials used for the pre-training baseline and baseline probes consisted of a ball, basin, washcloth, doll, book, chair, paper, paint, pocketbook, drawer, blackboard, chalk, lollipop, baby's bottle, bat, cup, jump rope, telephone, crayons, scissors and blocks.

Procedure:

In order to ensure that the stimuli chosen for the baseline procedures were familiar T. was required to name each object. If the subject did not identify an object it was eliminated from the baseline procedures. In choosing verbs for the training procedure, twelve college students were asked to rate thirty-nine verbs as 'durative' or 'nondurative' (Appendix A). A verb was accepted for use in the procedure if a minimum of seventy five percent of the raters agreed on its classification. The clinicians attempted to have each morphological ending equally represented, and an equal number of transitive and intransitive verbs included in the procedure.

In the pre-training baseline, T's ability to describe past events using the past tense morpheme was measured. One clinician performed live single actions (e.g. run) and T. was required to

describe the action to the other clinician. Two types of action verbs, duratives and nondurative, were performed by the clinician. Durative acts were performed for a minimum of ten seconds, whereas nondurative acts were momentary and did not exceed two seconds of performing time. A total of twenty durative and nondurative acts were performed (Appendix B).

Training: An observational learning procedure was used to train the past tense morphemes(/t/, /d/, and /Id/). T. was required to view three videotaped skits per session. Presentation of the tapes was randomized according to a latin square design. The skits performed by two clinicians depicted a short story. Skit one contained six durative verbs, skit two contained six nondurative verbs, and skit three contained three durative and three nondurative verbs. Each skit lasted approximately five minutes. After viewing each skit, T. was required to listen to a televised model (clinician 3) relate the events of the skit (Appendix C). The televised model was reinforced for correct production of the past tense morpheme. T. was reinforced for watching and listening to the skit and the model carefully.

T's use of the past tense marker was observed longitudinally. After each set of six sessions (3 skits per session), T. was required to tell the story of the skits to the clinicians. The subject's output was audiotaped, hand recorded, and later analyzed for the production of the past tense morpheme. In addition, baseline probes were administered to assess acquisition of the past tense morphemes. Baseline probes were identical to the pre-training baselines previously described. The training procedure was repeated five times over six months time.

Two post-training generalization tasks were administered. Generalization task I was identical to the pre-training baseline and the baseline probes except that novel verbs were used. Generalization task II elicited the past tense in naturalistic contexts, in which T. created events and was then asked to talk about them.

Results

Table 1 presents T's use of the past tense marker across the following conditions: pre-training, baseline probes 1-5 (administered throughout the training procedure) and post-training generalization tasks. An increase in the subject's use of the past tense morpheme is shown from pre-training to probe 5 (0% to 75% correct). T. performed better on Generalization Task 2 (78% correct) than on Generalization Task 1 (58% correct).

Table 1

Percent correct production of past tense morpheme

Condition	
Pre-training	0
Probe #1	26
Probe #2	34
Probe #3	48
Probe #4	44
Probe #5	75
Post-training Generalization Task 1	58
Post-training Generalization Task 2	78

T's correct production of the past tense marker when she related the events of the videotaped skits were as follows: Storytelling Time 1, (equivalent to the same point in time as Probe 1) 56% correct; Time 2, 72% correct; Time 3, 61% correct; Time 4, 67% correct; and Time 5, 60% correct. Although the subject's production of the past tense marker did not increase over time, T. consistently performed better on this storytelling task than on the baseline probes reported above.

T's use of the past tense marker on durative versus nondurative verbs is presented in Table 2.

Table 2

Percent correct production of past tense morpheme on durative versus nondurative verbs

Condition	Verb Type	
	Durative	Nondurative
Pre-training	0	0
Probe #1	28	25
Probe #2	38	30
Probe #3	47	50
Probe #4	48	40
Probe #5	76	75
Post-training Generalization Task 1	75	50
Post-training Generalization Task 2	80	75

As indicated by the percentage of correct responses, her performance on durative and nondurative verbs was essentially equal at all baseline probes with performance on duratives being slightly higher. A more marked difference between durative and nondurative verbs is evident for generalization task 1.

Discussion

The results of the present investigation revealed the efficacy of observational learning as a method for training a grammatical morpheme to a language impaired child. Moreover, the results showed that T. consistently used the past tense marker more often in the naturalistic generalization context (task 2) than in the structured generalization context (task 1). This finding suggests that the child's full productive capacities may not have been realized in the highly structured tasks. T's superior performance on the storytelling tasks versus the baseline probes is interesting since in this condition the subject had been provided with a model who utilized the appropriate inflectional forms. This result supports Brodey, Laney, and Combs (1978) finding that subjects performed better when a constant or intermittent model was present.

Our finding that T. performed equally well on durative versus nondurative verbs at all baseline probes did not support Bloom, Lifter, and Tanouye's (1978) results. Among their findings was that normal children marked the past tense on nondurative verbs first. The results of this study showed that verb aspect was not the main factor governing the emergence of the past tense morpheme. Subsequently, a post-hoc analysis of the data was performed in search of additional factors which may have influenced T's acquisition of the past tense. Specifically, the data was analyzed according to the transitive nature of the verb, position of the verb in her utterance, and morphological ending. Results showed that the past tense marker was generally used more often with intransitive verbs than transitive verbs. In addition, T. marked the past tense more often when the verb was at the end of her utterance than when it appeared in the middle. This finding correlated with the finding of better performance on intransitive verbs in that intransitive verbs are often found at the end of utterances. In terms of morphological ending, T. used the /t/ morpheme most often throughout the study. It is possible that these factors may have contributed more to T's acquisition of the past tense marker than the original hypothesis regarding verb aspect (nondurative before duratives). Another interpretation of the results may be that language-impaired children follow a different pattern of development than normal children.

Two important issues which may have contributed to the results need to be considered. The first issue is related to our method of verb classification. Adult raters categorized the verbs into the durative/nondurative distinction. Thus, adults' interpretations of verbs were imposed on the child. In accordance with Bloom and

Lahey (1978), a major problem with this type of etic approach is that the child's and adult's conceptions of the world may differ. Future investigations need to consider the child's interpretation of verb events.

The second issue deals with the use of observational learning as the training procedure. We chose this procedure in an attempt to make the training context as natural as possible. Realistically, a training procedure can not be compared to the naturalistic setting described by Bloom, Lifter, and Tanouye (1978). The results of this study illustrate the need for longitudinal data obtained in naturalistic settings on the acquisition of verbal inflections by language disordered children.

Finally, the present investigation as well as the work of Brown (1973), Bronckart and Sinclair (1973) and Antinucci and Miller (1976) highlight an important clinical consideration - a child can not be expected to use a grammatical morpheme across all categories of verbs simultaneously when it is first acquired.

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Appendix A

Task presented to raters:

Please read the following directions carefully.

Definitions -

Durative verbs - are those verbs which describe a continuous action. They do not describe a momentary action but instead an action which may last over some period of time, with no clear end result.

Nondurative verbs - are those verbs which come to a clear endpoint. They describe a momentary action and take a definite amount of time.

Rate each verb as durative or nondurative. ND = nondurative, D = durative.

talk	scream	push	sew	crack
walk	point	comb	hop	drop
pop	laugh	kiss	mix	crawl
pour	bounce	wipe	jog	knock
play	tickle	paint	kick	cry
pull	brush	dust	jump	brush
chew	close	open	spin	yawn
rock	clap	wash	spill	

Appendix B

Target Verbs and Tasks Performed during the Pre-Training Baselines and Baseline Probes

Durative	Nondurative
Clinician tickle doll	Clinician turn door knob
" write name	" drop paper
" run	" throw ball
" sleep	" kiss doll
" drink water	" push chair
" talk on phone	" cut paper
" walk	" break chalk
" draw house	" touch doll
" build building	" kick ball
" try to lift	" feed doll
" cry	" bite finger
" read book	" close book
" sing song	" hit ball
" scream	" open drawer
" laugh	" clap
" fight with doll	" leave room
" wash doll	" hop
" play with dolls	" catch ball
" swim in water	" jump rope
" paint house	" lick lollipop

Appendix C

Contents of Videotaped Skits as told by the Televised Model

Skit #1 - Pam jogged. She got so tired she walked. Then she leaned on the wall. The wall had a wet paint sign on it. Pam didn't see it. Fran laughed. Pam cried. Fran washed Pam's back off. Then they painted the wall.

Skit #2 - Fran had a hamburger. She wanted ketchup. She couldn't open it. She knocked it on the table. Then she pushed it away. Pam came and pointed to the ketchup. Pam opened it. She poured it. Then she closed it. Fran couldn't believe it so she tried again. She still couldn't open it. She got very mad and walked away.

Skit #3 - Pam got up. She yawned. Pam brushed her teeth. She talked to Fran on the telephone. Fran came over and they played a game. Then Fran jumped and Pam hopped.

Nature of spelling errors in transcortical sensory aphasia: A case study

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Abstract

The nature and extent of spelling errors in a patient with transcortical sensory aphasia were investigated. The two experimental conditions required that the patient spell monosyllabic and polysyllabic words both verbally and in written form. Analysis of his spelling errors revealed partially preserved knowledge of the visual image of a word as a whole, as well as preserved knowledge of temporal order. Our patient's error patterns in both conditions were more similar than dissimilar.

There has been relatively little research devoted to the spelling ability in aphasic patients. Previous investigators (Kinsbourne and Warrington, 1964; Bricker, Schuell, Jenkins, 1964; Basso Taborelli, Vignolo, 1978; Strub and Gardner, 1974; Nolls and Hoops, 1967; Kinsbourne and Rosenfeld, 1974; Nelson and Warrington, 1974) have either documented pure agraphia in selected patients or have explored the relation between spelling impairments and other linguistic deficiencies.

Not until recently, (Sasanuma and Fujimura, 1971; Wapner and Gardner, 1979) have investigators attempted to explore the nature and extent of spelling difficulties across patients presenting with aphasias of different type, severity and locus of lesion.

Sasunuma and Fujimura (1971) investigated spelling abilities in Japanese aphasic patients. They showed that their anterior aphasic patients exhibited a specific spelling impairment in Kana processing which employs phonetic symbols for syllables. Moreover, their posterior aphasic patients exhibited a spelling impairment in Kanji processing which employs non-phonetic logographic symbols.

Wapner and Gardner (1979) sought not only to explore the spelling abilities in different types of aphasics but also to determine whether spelling was governed primarily by memory for the visual image of a spelled word, by preserved knowledge of the rules of orthography or by a combination of these factors. Essentially, these investigators found that anterior and posterior aphasics exhibited comparable performances on the measures of spelling (e.g. oral, written and anagrams). However, they did find that posterior and anterior aphasics differed from one another on the kinds of words they most accurately spelled and the types of errors they were prone to make. Posterior aphasics' misspelled words resembled the target words in that the misspelled words continued to sound like the original. With the anterior aphasics, their misspelled words either contained reversals or omissions of letters, demonstrating that they retained a partial memory of how the words should look.

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Wapner and Gardner's, as well as Sasanuma and Fujimura's results suggest that two different spelling strategies are separately utilized by posterior and anterior aphasics. Posterior aphasics presumably choose letter combinations on the basis of their customary sounds, whereas anterior aphasics rely on a partially preserved memory for the visual representation of a word as a whole.

At present, no research exists on the nature of spelling errors in patients with transcortical sensory aphasia. Even Wapner and Gardner failed to include them in their posterior aphasic's group. They did however cite an unpublished case study by Shannon (1976). Reportedly, this transcortical sensory aphasic in the face of marked comprehension difficulty, demonstrated a preserved sense of orthography. He could accurately spell familiar and nonsense words.

Thus the purpose of our study was an attempt to systematically investigate the nature and extent of spelling abilities in an individual exhibiting transcortical sensory aphasia. Patterns of spelling errors were analyzed to determine whether these errors would be consistent with those exhibited by anterior and/or posterior aphasics. It was also hoped that our analysis would provide us with a clue as to the nature of the spelling strategy being utilized.

Method

Subject:

Our experimental subject was a 67 year old male, (S.) who exhibited a profile of transcortical sensory aphasia[1] on the Boston Diagnostic Aphasia Examination (BDAE). In the face of a marked comprehension deficit, echolalic behavior as well as irrelevant fluent responses were observed. Our subject's behavior during formal testing provided the original impetus for us to study his spelling abilities. Our subject was able to visually identify some printed words on the BDAE's subtest of written word recognition. Furthermore, on occasion he self-initiated oral spelling of a few simple words on the Boston's subtest of auditory discrimination. His hearing ability was within normal limits. He was right handed without any apparent hemi-paresis. Our subject was two years, 11 months post CVA, had never received any rehabilitative language treatment until he attended the Queens College Speech and Hearing Center.

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[1] Typical patient does not initiate speech of his own. When spoken to, patient replies with well-articulated but irrelevant paraphasia which includes actual English words and neologisms. Patient echos the examiner instead of replying, however, the patient can repeat sentences of considerable length and complexity. Patients also exhibit an ability to memorize material. Both reading and writing are severely impaired (Goodglass and Kaplan, 1976).

Addendum (to follow 71)

Apparatus:

In order to analyze S's spelling pattern, we designed a test battery. This consisted of 269 high frequency words obtained from Thorndyke Lorge's list of the most frequently used words in the English language. There were 220 mono-syllabic words of similar length (i.e. 3-6 letters) and 49 poly-syllabic words varying in length from 2-4 syllables. In total, 146 of these words were presented in the verbal spelling condition and 123 of these words were presented in the written spelling condition. In addition, 49 of the stimulus words were selected for repeated testing to determine whether S's spelling errors were consistent in nature. One month prior to testing, S was visually provided with the printed words to identify. Only those words identified by S were selected as the stimulus test words.

Procedure:

Prior to the administration of the test words, S received pretest training in order to ensure that he fully understood the instructions. There were two test conditions. S was required to spell words both verbally and in written form.

During the testing condition, S was requested not to say the word aloud but to simply spell it in one of the two modalities:

1) Verbal spelling condition:
   "Spell_____for me aloud. Do not say the word, just spell it."

2) Written spelling condition:
   S was provided with a blank sheet of paper and a pen. "Spell _____for me on the paper. Do not say the word, just spell it."

In both conditions, one repetition of the word was permitted upon request. During testing an examiner and two graduate students independently recorded all of S's responses. In the verbal condition, all responses were audio recorded for later transcription. Testing was accomplished over nine, one hour sessions during a period of three weeks.

The data from the two test conditions was then analyzed and compared. Specifically, the data was analyzed in terms of the percentage of:

1) Letter errors in the verbal vs. written spelling conditions;
2) Correct responses as compared with close (i.e. only one letter error per word) and gross (i.e. unintelligible words) approximations of the target word;
3) Monosyllabic versus poly-syllabic word productions;
4) The type of letter error (i.e. omission, additions, substitution);
5) Substitution errors in terms of visual and acoustic[2] feature errors;
6) Vowel vs. consonant letter errors;

2 Visual - confusion of one letter for another which are similar in appearance. Acoustic - confusion of two letters having similar articulatory features, such as place, manner and voicing.

7) Letter position in a word (i.e. initial, medial, final);
8) Consistency of letter errors in a word;
9) and lastly, types of orthographic errors, such as silent or double letter errors.

Reliability of the examiner's scoring of the taped responses was determined by having two graduate speech pathology students independently score all the taped responses of the subject. The obtained reliability coefficient of .98 was considered high enough to establish judgment reliability.

Results

Overall, S's spelling error patterns were more similar than dissimilar in the verbal and written spelling conditions. However, S's spelling performance was better in the written condition. Further, test results revealed that S had fairly well preserved knowledge of the visual image of a word as a whole. Although he demonstrated partially preserved knowledge of orthography, a primary deficit in letter selection was evidenced.

Table I displays the types of spelling errors that occurred within a word.

Table 1

Percent of spelling errors in the verbal and written conditions

Type	Verbal	Written
Substitution		
Consonant	56.8	15.9
Vowel	14.8	15.9
Omission		
Consonant	10.0	4.6
Vowel	6.0	8.6
Addition		
Consonant	6.0	0.
Vowel	3.0	2.6

In comparing S's overall performance in the two conditions it was noted that his performance was significantly poorer in the verbal-spelling condition. Of the total words presented, he errored 96.6% of the time in the verbal-spelling condition, whereas he only errored 47.6% of the time in the written-spelling condition.

Overall for both conditions, substitution errors comprised the majority of the letter errors (i.e. verbal: 71.6%; written: 31.8%). In both conditions addition errors comprised the least percentage of the spelling errors (i.e., verbal: 9.0%; written: 2.6%). Specifically with the substitution errors, consonants were significantly more in error than were vowels in the verbal spelling condition. However, in the omission and addition categories, there were slightly more errors with vowels than with consonants in the written spelling condition.

It should be noted that some of his letter errors were out of class. In the verbal condition, he substituted consonants for vowels seventeen times, and vowels for consonants twelve times. In the written condition, he substituted consonants for vowels nine times, and vowels for consonants six times. (Examples of these include: stenk/steak; cai/car; bee/bed; cakn/cake). In both conditions a large percentage (94%) of the misspelled words were close approximations of the target words. In other words, only one omission or letter substitution error occurred in a word. Unacceptable misspelled words, letter reversals (i.e. gyra, grya/gray) and semantic substitution errors (i.e. time/watch) accounted for only a small percentage (5%) of the total number of his spelling errors. The results suggested that S had fairly intact visual ability and primary deficit was in phoneme-grapheme correspondence.

During testing, an unanticipated phenomena occurred which provided us with further insight into the type of spelling strategies being used. In both test conditions, particularly in the verbal condition, our subject spontaneously made 64 repeated attempts at spelling target words. With each successive attempt, a closer approximation or even the exact spelling was achieved. These repeated attempts indicated that S had some awareness of his errors. Moreover, it suggests that when he was unable to rely on his orthographic-phonetic knowledge, he utilized his knowledge of the gross visual representation of a whole word to guide his search selection.

In attempting to determine whether our subject's selection impairment was more visually or acoustically based, we analyzed his substitution errors in terms of visual and acoustic feature systems. Our analysis revealed his letter errors to be random in nature (69%). However, when we further analyzed his letter errors in terms of the specific articulatory features, a pattern did emerge. For instance, proportionately more velar place errors (63.5%), more plosive manner errors (63%) and more unvoiced feature errors (77.7%) occurred in the verbal spelling condition. Although of significance, his feature errors were dissimilar in the written spelling condition. More labio-dental place errors (25%); more semi-vowel manner errors (25.4%); more voiced feature errors (1.69%) occurred in this condition. These results lend more support to the notion that the selection of letters was guided more by our subject's articulatory-phonological knowledge.

The consistency of the letter errors within a word for both the verbal and written spelling conditions were also analyzed. Errors

occurring on the same letter in a word were highly consistent in the written-spelling condition (72.2%), whereas they were less consistent in the verbal-spelling condition (56.8%). However, in both conditions, the letter being substituted for the one intended was not always the same.

A few additional results should also be mentioned. S's overall rules for spelling were fairly well maintained. He rarely demonstrated spelling errors for double letters (.25%) or silent letters (1.0%). In poly-syllabic words he maintained preserved knowledge of syllabic units. Further, S demonstrated preserved knowledge of morphological rules such as noun pluralization and verb tense. More letter errors occurred in the final position of a word (i.e. verbal and written conditions: initial: 19.6%, 6.4%; medial: 19.6%, 19.4%; final: 60.7%, 29.7%, respectively). Lastly, S exhibited similar errors in both test conditions regardless of word length or word class.

Discussion

In summary, S displayed more spelling errors in the verbal as opposed to written spelling condition. However, his error patterns in both conditions were more similar than dissimilar. He presumably performed better in the written condition because the visual feedback was more permanent, whereas in the verbal spelling condition the auditory feedback decayed rapidly. In both experimental conditions, word length and word class did not have any significant effects on the types of errors made by our subject.

The overall results reveal that our subject had fairly intact knowledge of the visual image of a word as a whole, as well as preserved knowledge of temporal order. Although he demonstrated partially preserved orthographic knowledge, a primary deficit in selecting the correct letter was evidenced. In other words, our subject displayed difficulty in pairing the correct letter with its sound. Furthermore, his responses indicated that his general rules for spelling were intact as evidenced by preservation of double letters, silent letters, morphological endings, temporal order, and number of syllable segments.

Our results are in some agreement with those reported in the literature. S's error patterns resembled to some extent those exhibited by both anterior and posterior aphasics with more of a tendency toward the posterior group. In Wapner and Gardner's (1979) investigation, the words misspelled by the posterior aphasics were similar to the target words. This pattern is identical to the one demonstrated by our subject. These authors suggested that posterior aphasics have partially preserved knowledge of the rules for translating sound into letters. According to Wapner and Gardner (1979) their anterior aphasics tended to reverse letter order and to omit letters. It is suggested by these authors that the anterior aphasics have a partial image of how the word should look.

The subject in our experiment, in contrast to the anterior aphasics

in the Wapner and Gardner (1979) study, exhibited few letter reversals and letter omissions. This suggests that our subject had a substantial image of how the word should look, however, his selection difficulties did not allow for a totally correct response. As a result, our subject may have used the same strategies exhibited by both the anteriors and posteriors, as observed in the Wapner and Gardner investigation.

In support of our findings, Sasanuma and Fujimura (1971) investigated a patient who had symptoms similar to those of a transcortical sensory aphasic. Their patient evidenced marked difficulty in writing Kanji (i.e. non-phonetic logographic symbols) spontaneously and to dictation. As with our subject, their patient demonstrated partial spelling ability in the face of severe comprehension deficit. Thus, current investigations as well as our own support the notion that two types of spelling strategies are utilized by anterior, posterior and transcortical sensory aphasics.

In view of the severity of the language difficulties exhibited in transcortical sensory aphasia as discussed in the literature, (Goodglass and Kaplan, 1976; Luria, 1966) it is of significance to note that our subject's spelling abilities were more intact than his other language areas. This finding may be of relevance to the speech-language pathologist, since the literature reports that language rehabilitation (Kabelyanskaya and Viting, 1968) in patients with transcortical sensory aphasia is extremely poor. Therefore, spelling may serve as a viable avenue for treatment. For example, we were able to successfully design and implement a treatment program based upon the knowledge of our subject's spelling abilities. Essentially, with five months of intensive treatment, our subject not only improved his functional communication skills but a majority of his scores on the Boston test significantly improved. Specifically, both his written and auditory comprehension skills improved. Also, he learned to spontaneously spell those words aloud that he verbally could not express for his functional needs. As his echolalia decreased, an increase in paraphasic errors as well as short functional phrases also resulted.

Future research investigations designed to access spelling abilities in aphasic patients are warranted. Not only will they provide additional information concerning the nature of the underlying linguistic deficits but they may provide relevant input when devising systematic treatment programs for individuals who are severely impaired linguistically.

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